

RAILROAD GAZETTE

FRIDAY, NOVEMBER 7, 1879.

The Hall Automatic Electric Railroad Signal.

BY THOMAS F. KRAJEWSKI, M. E.

DESCRIPTION OF THE APPARATUS.

(Concluded from page 578.)

The diagram fig. 11 shows the connection of wires of the two signals, "safety" and "danger," which constitute one signal post. The disk of the "danger" signal is shown displayed, while the disk of the "safety" signal is hidden (both being, however, in the raised position). By referring to fig. 1, and the description thereof, it will be seen that such position of the signals indicates that the section of the road which is guarded by them, is occupied by a train. The signals remain in this position until the train passes over a track instrument, marked "Opens the section."

Every track instrument connects the "ground wire" with the signal apparatus (as was shown in fig. 3); but that track instrument which *opens* a section connects with the "safety signal" apparatus, namely, with its connector, 2 (see fig. 11), and that track instrument which *closes* a section connects with the "danger signal" apparatus, namely, with its connector, 3.

If, therefore, in the position of signals shown in the diagram, the train passes over a track instrument that *opens* a section, an electric current is closed which runs from the ground through the track instrument, the safety signal, namely, its connector 2, circuit-closer *H*, connector 1, electro-magnet *N N*, and hence through the battery to the ground again; or *vice versa*. (The connection of wires is indicated in the diagram with dotted lines.) As the electro-magnet, *N N*, becomes vitalized, it produces a fall of the "safety signal" disks, which will then take the displayed position shown in dotted lines. At the same time the circuit-closer, *H*, will swing, or switch off, from the position indicated by a full line into the position *H'*, shown by a broken line, which change of position will break the circuit between the connectors 2 and 1, destroying the vitality of the electro-magnet *N N*. The action of the electro-magnet is thus momentary, and as soon as the stroke of one wheel of a train on the "track instrument" has produced the change, all subsequent strokes are without effect; hence, that portion of the apparatus which contains the circuit-closer *H* has been called by the inventor the "cut-out."

At the same time that this is accomplished, the spring circuit-closer *T*, of the "safety signal," by the action of the finger *P* (fig. 8), closes another current, which runs from the ground through connector 6, the circuit-closer *T*, connector 5, to the danger signal, namely, through its connector 2, circuit-closer *H*, connector 1, to the electro-magnet *N N*, and thence through the battery to the ground again; or *vice versa*. This circuit causes the fall of the disk of the "danger" signal, in which position it is hidden. The circuit-closer *H* of the "danger" signal will then take the position shown by the dotted line, breaking the circuit, but producing no other effect. The position of both the signals will thus be reversed and the section will be opened for traffic. If a train should now enter upon this section, the track instrument which *closes* the section would be struck by the wheel, and cause a current to pass from the ground through the track instrument to the "danger signal," namely, through its connector, 3, the circuit-closer in the position *H'*, connector 4, to the electro-magnet *M M*, and thence through the battery to the ground again, or *vice versa*. This would cause the disk of the danger signal to rise again in the displayed position, and the circuit-closer to take the position shown at *H*. As soon as this is accomplished the spring circuit-closer *T* of the "danger signal" would close momentarily, completing a circuit that passes from the battery through connector 6, circuit-closer *T*, connector 5, to the connector 3 of the "safety signal," then through its circuit-closer in the position *H'* to connector 4, then to the electro-magnet *M M*, and thence through the ground to the battery again. The disk of the

"safety" signal will rise therefore into its hidden position. The section of the road will thus be closed again for traffic until the operation described at first is repeated.

If the signals belong to a depot section, the apparatus of the safety signal is provided with another spring circuit-closer, *T*, which, when the disk rises, is closed and completes a circuit passing from battery through connector 8, circuit-closer *T*, connector 7, and thence through a bell (placed at the station) and the ground to the battery again, or *vice versa*. Thus the approach of a train is announced at the station. In this manner the signals are operated by the movements of the trains themselves.

The *Switch Interlocking Instrument* is shown in figs. 12, 13 and 14, representing, respectively, two vertical sections and a plan of the instrument when in its normal position. Three other positions of the instrument are shown in plans, figs. 15, 16 and 17.

It consists of a lever, *L*, pivoted at *PP* in a casting *G*, the lower portion of which is shown broken off, but which resembles the casting of the track instrument, and is likewise bolted to a cross-tie of the road. The lower end of the lever is connected with the switch-rails, by a rod, in such manner that when the switch is being moved the lever *L* swings on

other. The tendency and object of this spring is to lead the rocking-arm *k* and the pin *p* to the normal central position.

The circuit-closer *a* is operated by means of an insulated button, *m*, attached to a stud, *x*, which is fastened to a sliding plate, *E*. This plate is held in position by means of a washer and a screw, as shown at *r*, figs. 13 and 14; a slot in the plate *E*, through which the screw passes, admits of a motion to the plate in the direction of its length. The plate *E* takes the motion from the pin *p* which passes through it, as shown in the sectional views; but there is also a longitudinal slot, *i* (figs. 13 and 14), which enables the pin *p* to accomplish some motions without moving with it the plate *E*. It will be observed that in the position of the plate *E* shown in fig. 14 the button *m* presses on the circuit-closer *a*, which is then closed. This is one fixed position of the plate *E*, the other fixed position being when the circuit-closer *a* is released from the pressure of the button *m*, as shown in fig. 15. It being important that the plate *E* do not move from its fixed positions by the action of any accidental cause, a projection, *v*, is made in the edge of the plate, which bears against a fixed stud, *w* (shown in the plan), being held thus by the tension of a small spiral spring, *q*. When the plate *E* is to be moved, sufficient power must be applied to force the projection to pass to the other side of the stud *w*.

The pin *p* is moved by one of the cams *b* or *b'* of the lever *L*, when the switch is being moved and the lever consequently changes its position from the vertical to one of the diagonals, shown at *ll*, or *l' l'* (fig. 12). Suppose that this action take place, and that the lever *L* swings to the position *ll*. Let us then consider the relative changes of position which will take place between the cams and the pin *p*, as they are shown in plan in figs. 18, 19 and 20. Fig 18 shows the normal position in which the pin *p* is between the cams *b*, *b'*; but as the lever is moved the cam *b* comes in contact with the pin, forces it to one side, as shown in fig. 19, and when the lever *L* completes the swing, the pin *p* passes to the other end of the cam *b*, as shown in fig. 20. The pin *p* then returns to the centre line of the cams by the action of the spring *s*. The switch is now set for the siding. In the return movement, the cam *b* is moved in the opposite direction, forces the pin to the other side, as shown in fig. 21, and at the completion of its movement the pin takes again the central position, as shown in fig. 18. The switch is then set back for the main line.

The object of the second cam *b* is to provide the same action on the pin *p*, if the switch has three throws. An examination of fig. 18 will show that the pin *p* will make movements identical with those just described, whether one or the other of the cams acts upon it.

Before describing the various effects of this operation, it remains to be said that the circuit-closer *a* is interposed in the wire which connects the

signals with that track instrument which sets them in the safety position, or opens the block section (examine fig. 2). If this circuit-closer *a* is closed, an electric current—when closed by the said track instrument—will pass through the connector 1, circuit-closer *a*, connector 2, to the signals (see fig. 14); but when the circuit-closer *a* is opened, the track instrument will have no effect on the signals, as the connection is broken. The second circuit-closer *c*, of the switch instrument closes a circuit which acts on the signals, setting them in the *danger* position—closing the block section—while the third circuit-closer, *e*, closes a circuit which sets the signals back to the *safety* position.

This operation will now be easily understood.

When the switch is set for the main line, the position of the various parts of the apparatus is as shown in fig. 14. Only the circuit-closer *a* is then closed, establishing the communication between the track instrument and the signals, which can thus be operated by the passing train. (In the description of a depot application, fig. 2, it is indicated that the hand instrument at the station cannot act on the signals if the switch is set wrong to main line; this is effected by interposing the same circuit-closer *a* of the switch instrument in the wire connecting the hand instrument with the signals.)

When the switch is being moved, the pin *p* is momentarily forced on one side of the cam *b* (see fig. 19), and effects what is shown in fig. 15, namely: It breaks the communication between the track instrument and the signals by open-

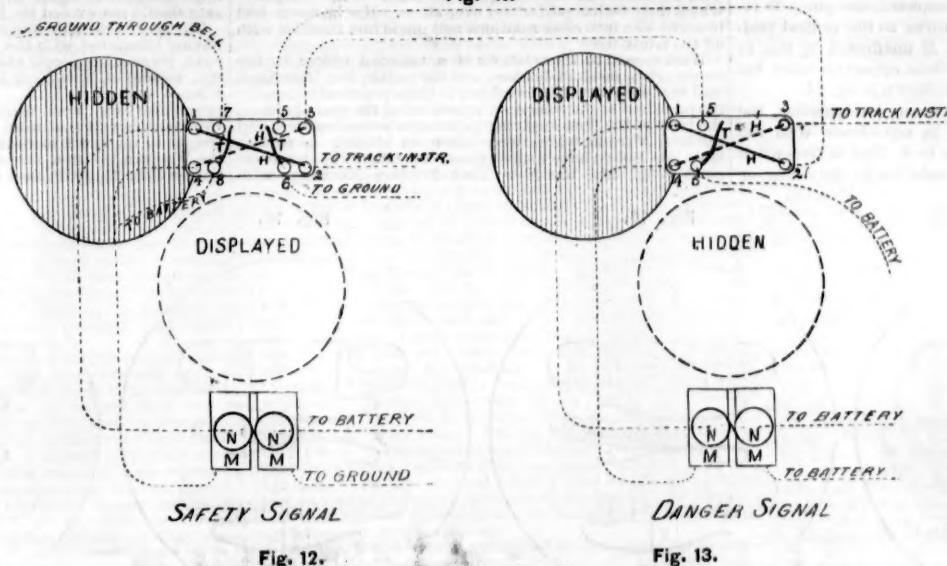
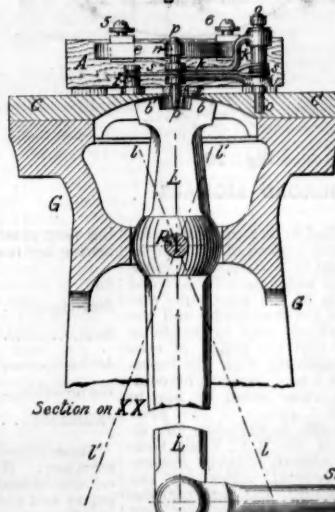


Fig. 11.



HALL'S AUTOMATIC RAILROAD SIGNALS.

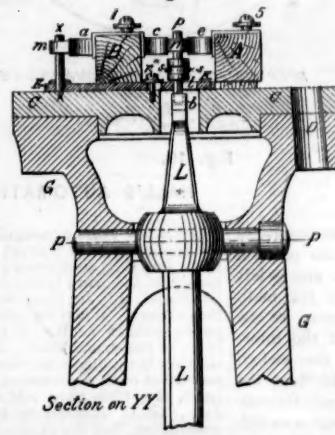


Fig. 13.

its pivot, taking a position indicated by the centre lines *ll* or *l' l'*, fig. 12. While the switch is set for the main line the lever *L* has the vertical position, as shown in the engraving. The upper end of the lever is provided with two cams, *b* and *b'* (fig. 12), which are shown also in plan in a separate sketch, fig. 18. The casting *G* has on its top a cover, *C*, on which are attached two insulating wooden blocks, *A* and *B*, carrying six metallic plates with connectors, marked 1 to 6. Three spring circuit-closers, *a*, *c*, *e*, serve to effect closures, or a breaking-off of the electric currents between the connectors; the circuit-closer *a*, between connectors 1 and 2, the circuit-closer *c*, between connectors 3 and 4, and the circuit-closer *e*, between connectors 5 and 6. They are operated by means of the following mechanism, and in the following manner:

Between the circuit-closers *c* and *e*, in the centre of the machine, is a pin, *p*, which is held by one end of the rocking-arm, *k*, the other end of which is pivoted by a stud, *o*, around which the arm, with the pin *p*, can swing in the horizontal plane. The pin *p* carries at its upper end an insulated button, *n*, which, pressing on one of the circuit-closers, *c* or *e*, will establish electric communication between the respective connectors. Around the stud *o* is wound a spring wire, *s*, in such manner that both its ends are carried straight, one on each side of the rocking-arm *k*, to a stud, *z*, fixed on the cover, which holds the ends of the said spring in the normal position (as shown in fig. 14) if no outside force separates them from each

ing the circuit-closer *a*—the pin *p* having moved the slide *E* and with it the button *m* to the position shown; it closes the circuit-closer *c*, thus setting the signals at danger and closing the main line against trains. At the completion of the movement of the switch to the siding, the pin *p* is released from the action of the cam (see fig. 20); and, as shown in fig. 16, the pin by the action of the spring *s* (which has been previously forced into the position shown in fig. 15) is moved back to the centre line—the slot *i* in the slide *E* admitting this movement without being itself affected by it; all the three circuit-closers are then opened. It should be remembered that the signals are now set at danger by the momentary closure of the circuit-closer *c* during the intermediate position, and that no track or hand instrument can reverse them, in consequence of the position of the circuit-closer *a*.

When the switch is being moved back to the main line, the pin *p* is forced to the other side of the cam *b* (see fig. 21), and the change of position is as shown in fig. 17, namely, the circuit-closer *c* is now closed, effecting the reversal of the signals from the danger to the safety position; the circuit-closer *a* is also closed, establishing the, until now broken, communication between the track instrument and the signals, in consequence of the movement of the slide *E*. As soon as the return movement is completed, the pin *p* is released (as shown in fig. 18) and returns to the central position, leaving, however, the slide *E* unaffected by this, in consequence of the slot *i*, and the whole apparatus takes the position already described, which is shown in fig. 14.

It remains to be added that, by a wrong manipulation, the signals may be so set as not to be in accordance with the position of the switch, but contrary to it. That is, the switch may be moved half-way from the main line to the siding, or

be given. We have compiled it from the official report, as the current reports in the daily papers were very brief and imperfect:

Mr. Blanchard was examined by Judge Shipman, counsel of the New York, Lake Erie & Western. He testified that his railroad experience began in 1858, at the age of 17, as clerk in the general office of the Cincinnati & Chicago Railroad, at Richmond, Ind., of which road his father was then General Superintendent. There he had charge of the passenger and freight accounts of the station agents for a year, and then became the company's agent at Richmond. After about a year in that place he became a clerk in the local freight office of the Ohio & Mississippi at Cincinnati, having to do with through freight west-bound for about a year, and then becoming cashier in Cincinnati; the next summer he was sent to St. Louis as chief clerk in the general freight office, and within a year was made General Freight Agent. For six or eight months he was General Passenger Agent, also. About 1862 he became General Freight Agent of the Central Ohio Railroad, of which Mr. Hugh J. Jewett was then Receiver. About two and a half years later the Central Ohio was leased to the Baltimore & Ohio, when he was appointed General Freight Agent of the latter road, and went to Baltimore to take charge of its freight business, and remained there directing the business on this road and its several leased lines in Maryland, Pennsylvania and Ohio for about six years. Then, October 1, 1872, he entered the service of the Erie Railway under President Watson as General Freight Agent, and the next July was appointed Second Vice-President, having charge of the traffic of the company, which duty he has performed ever since. His business had brought him into close relations and made him familiar with all the trunk lines.

With regard to the relations of a railroad officer to the corporation, its stock-holders, and the public, Mr. Blanchard said that such an officer is subject to three practical tribunals: the president of the company, representing the share-holders; the laws of the land applying to transportation business, and the laws of trade, which were often as binding as statute law. He had to have negotiations with officers of trade organizations, like the New York Produce Exchange with

In November, 1874, the Erie notified the Western connections that it would not pro-rate on any rate they might make to local points on its line, but only if it was allowed a certain minimum rate. Then new local grain rates were issued for grain received at local points, which were never more than the rate from Buffalo. These rates were 25 cents per 100 lbs. from local points on the Rochester and Susquehanna divisions to New York; 27½ cents from the Buffalo Division and 30 cents from the Western Division. For shipments from local station to local station the rates were 25 cents for distances not more than 385 miles, 27½ from 386 to 423, and 30 cents from 423 to 460 miles; but where the old local tariff made lower rates for short distances, it governed.

At the end of a year after this change, which made considerable reductions, investigation showed an increase in the amount of grain shipments; but a decrease in the profits from grain shipments; but in view of the possible greater activity in other traffic as a consequence of larger grain production, this policy was announced as a permanent one. The road now carries grain from local points to New York for 15 to 22½ cents, while the rate from Chicago is 35 cents.

He desired to be explicit in stating that he thought the rate from Chicago, for example, to New York, should always be more than the rate charged to farmers of New York, though he did not think it should carry from its stations either to New York or its local stations at the proportion of the rate which it receives from the West. In answer to a question, he said that circumstances might justify the road in charging more on flour from Rochester to Binghamton or Port Jervis, than from Buffalo to New York. If other things were equal, he thought the Rochester-New York rate should not exceed the Buffalo-New York rate.

The special rates on other roads and the low canal rates having interfered with the local traffic west-bound on his road, leaving the people at some stations to go to Rochester, etc., instead of New York for supplies, in 1877, after a conference with Mr. H. B. Clafin, Judge Hilton and other prominent New York merchants, witness recommended to President Jewett that rates to local stations on west-bound freight be made not more than the rates to Buffalo, and on the Western Division not more than the rate to Dunkirk; and on Feb. 21, 1878, such a tariff was put into effect, making

Fig. 14.

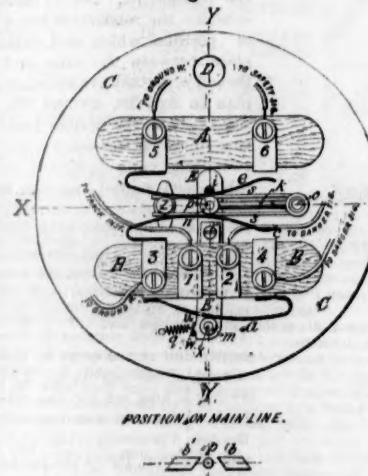


Fig. 18.

Fig. 15.

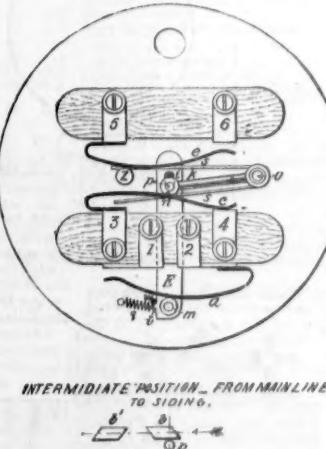


Fig. 19.

Fig. 16.

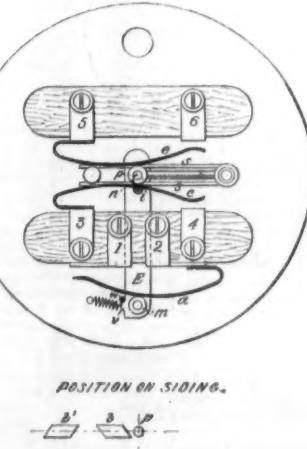


Fig. 20.

Fig. 17.

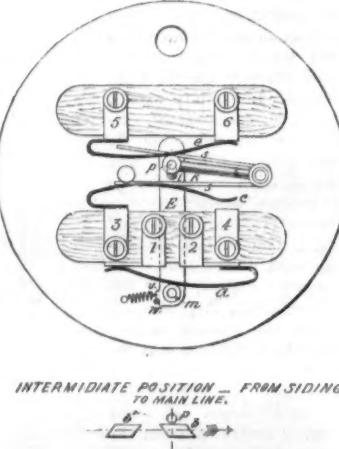


Fig. 21.

HALL'S AUTOMATIC RAILROAD SIGNALS.

vice versa, and then be moved back before it accomplishes full stroke. In the first case, in consequence of the position shown in fig. 15, the signals will be set at danger and left in that position, although the switch is set back for main line; in the second case, a worse thing will happen, as the signals may be set to safety, in consequence of the intermediate position shown in fig. 17, while the switch is set back for the siding. To overcome this fault of the apparatus—which however, could have effect only through the malice of a switch-tender—the lever with which a switch is operated can be attached to a special switch-stand, so arranged as to make it necessary that a switch be moved its full throw before it can be reversed.

In the same way as a switch is interlocked with the signals, the lock of a draw-bridge is made to control them. Perhaps at some future time a detailed illustration and description of this apparatus will be given.

Finally, it remains to be added that still another improvement has been added by Mr. Hall to the *guarding of railroad crossings*, namely, a continuous electric bell is made to ring at such places of danger, from the time the train is half a mile or some desired distance from the crossing until it has passed it. This is effected by placing two "track instruments" at the points between which the train is to be signaled: the first of them causes the electric bell to ring, and the second stops its action. Thus a continuous signal, audible all the time that the crossing is in danger, not only keeps control over the watchman, but also, in case of his absence, sudden illness, or neglect, will of itself warn persons attempting to cross the track of the danger.

Mr. G. R. Blanchard's Testimony Before the New York Investigating Committee.

At the recent session of the New York Assembly Railroad Investigating Committee in New York, Mr. G. R. Blanchard, Assistant to the President of the New York, Lake Erie & Western Railroad, was on the stand eight days, and gave in his testimony an enormous amount of evidence concerning the practices of railroad companies in making rates and the circumstances which lead them to adopt such practices, together with statistics of commerce, rates, etc., which have very great value, and are of a nature not easily procurable, especially collected together. This testimony by itself makes a large volume, and in the summary of it, which we give below, little more than a sketch of its leading statements can

which a few years ago regulations had to be agreed upon for the change in sales of grain by grade instead of by sample, while just then conferences were had to introduce the central system in the grain trade, in both of which the reforms could be effected only by the co-operation of the merchants and the carriers. When the interests of the shareholder and the public come in conflict, he believed it his duty to decide in favor of the shareholder. To show that the policy of considering the public interests and consulting with the representatives of those interests was not a new one with his company, Mr. Blanchard adduced a circular issued by him in June, 1874, directed to the station agents of the Erie, announcing that the chiefs of the traffic departments (Mr. G. R. Blanchard, Second Vice-President, Mr. R. C. Villas, General Freight Agent, and Mr. J. N. Abbott, General Passenger Agent), would visit the several states on the road to discuss matters concerning the accommodations furnished the road with its patrons, and to hear any complaints or suggestions they might have to offer, and the agents were instructed to notify the public of such visit. He also presented a copy of a speech made by himself in answer to the toast "Our Railways" at a dinner of the Produce Exchange in May, 1874.

When he came upon the Erie Railway in 1872 he found in force a local tariff issued May 1, 1865, a copy of which he submitted, the basis of which was 10 cents per 100 lbs. for first-class freight, 8 for second-class, and 5 for third and fourth class, for any short distances, to which was added 25 cents per ton for handling. Then up to 50 miles the rate in addition to the 25 cents for handling was 5, 4, 3, and 2 cents per ton per mile for the four classes, respectively. Between 50 and 100 miles these rates were not maintained, as they were limited variously by competition on the canal and other railroads. The tariff covered 960 miles of road and 265 stations, 32 of which had no agents. When the road was opened, the complications were much less than now, when it is crossed by 15 other railroads which compete with it at 35 points.

He believed it perfectly legitimate to take into account the value of the service rendered by the carrier in fixing charges, which has been called "charging what the freight would bear."

The completion of new roads always made necessary a readjustment of rates. There had been a great change in the state's canal policy, and many articles that paid 6½ cents toll per 100 lbs. in 1870 do not pay a cent to-day. This made it necessary to change railroad rates. The reduction in tolls on the canal since 1870 on certain articles had been as follows, per ton of 2,000 lbs.:

Pot and pearl ashes, from.....	\$1.38 to 17½ cents
Beef.....	1.50 " nothing.
Beef.....	1.38 " "
Bacon.....	0.69 " "
Butter.....	1.38 " "
Lard and lard oil.....	0.69 " "

Mr. Blanchard handed in as part of his testimony the toll sheets of 1870 and 1870.

As competition was felt at various places theretofore local, the endeavor was made to adjust the rates as nearly as possible to prevent injury at any one.

ing very great reductions at many points, of which the following are samples:

	Class.	
To	1. 2. 3. 4.	
Binghamton..... Old rate.....	61 46 34 27	
	New rate.....	40 30 25 20
Bath..... Old rate.....	82 63 45 36	
	New rate.....	40 30 25 20
Addison..... Old rate.....	80 61 44 35	
	New rate.....	43 35 30 23
Hornellsville..... Old rate.....	86 66 47 38	
	New rate.....	43 35 30 23
Salamanca..... Old rate.....	95 72 56 46	
	New rate.....	43 35 39 23

These rates have resulted in a large loss of income to the company. Witness did not believe that reductions in rates on miscellaneous traffic tended to increase much the prosperity and growth of the country along the line, such as follow the establishment of large manufacturing establishments fostered by the railroads. The reduction was made because the public had a right to complain if the rate to Hornellsville was 83 cents when the rate to Buffalo was 40 cents. This tariff has been considered as experimental. A general tariff was in course of preparation which was intended to take into consideration all the various interests.

Mr. Blanchard believed that he could prove that there was not on the face of the globe an equal amount of territory with an equal population that got its rail rates at anything approximating the average prices paid by the people of New York.

In the canal the state holds the great controller of freight rates in its borders. Not a town in the state but was affected more or less by the canal policy of the state. If the rate from New York to Buffalo by canal was 12 cents, then the rate on the Erie would be limited by the canal rate to Buffalo, plus the rail rate from Buffalo back to Attica. If 4 cents of the twelve were toll, and the tolls were abolished, it would be necessary to reduce the rail rate from New York to Attica by 4 cents. If an inflexible tariff were made and publicly announced, roads chiefly outside of the state would take advantage of it to reduce their rates to a little lower amount at the points where they came in contact, and so secure all the business of those points. A public rate from which no drawback could be made on the Erie road would cause the surrender of a large part of the business of the Southern tier of counties of New York to rival companies.

For some cases it was impossible to frame a tariff beforehand. When a new manufactory was to be established, for instance, the possibility of making it profitable depends largely on the rates charged on its raw materials and products, and its founders will put it on some other road if the result will be more favorable there. As the circumstances are not known beforehand, the rates cannot be fixed beforehand, on general principles. This is a case constantly arising. So when works are established, their ability to secure certain important contracts may depend entirely upon the rates charged them for transportation. A number of bridges are to be built in the West, for which bridge-works in Pitts-

burgh, Detroit, Chicago, Phoenixville, Pa., and Paterson, on the Erie, all bid. It might be for the interest of the Erie to give rates from Paterson, on the iron for the bridges, which would be in themselves unprofitable, because in order to manufacture the iron the works would have to have a great deal of other transportation over the road, as limestone, ores, etc. If the rate were fixed and unchangeable on the Erie, other transportation lines, not restricted as to rates, would reduce theirs just enough to secure all such contracts to works on their lines. This question came up when the great contracts for the material for the New York elevated roads were given out, and the works at Paterson had to bid against those at Edge Moor, near Wilmington, Del. The Paterson works get their coal, fire-brick, and other supplies over the Erie, and their increased business caused travel, and generally improved the business of the place. When it brought a thousand dollars to the railroad, it brought ten thousand to the City of Paterson.

In answer to the question what kind of a tariff it is practicable to make, Mr. Blanchard's answer was, in full, as follows:

"I have undertaken, Mr. Chairman, in the tariff which has been under discussion between the General Freight Agent and myself, to first establish between the through points like Buffalo and Dunkirk and New York and Piermont and Newburgh, certain rates which may be regarded as an average of the present through tariffs of the country; we then, going over the list of special rates that were made—because prior to these sweeping reductions that we made in the tariffs, as I have before shown, a great many special rates necessarily crept in that we have wiped out—took the average experience of all the officers of our company called together, its division superintendents, its leading station agents, its district agents, of which there are three or four of those officers in the company who have served it faithfully for from 15 to 25 years, the experience given you by Mr. Rutter in his able conduct of our local affairs under which these industries very largely grew up, and which fortunately he reduced before leaving our company to writing—take that and make as near an average rate, as the altered circumstances of the country, the new values of products, the competition of the canal, the rivalry of companies on both sides of us, the fixed tariffs on the Lackawanna, Northern Central, the Oswego Midland, the Albany & Susquehanna—all that other companies will permit us running in between those various interests to prescribe. And any such tariff as that after being completed is in itself merely a general guide to the rules that should govern us in the management of our business; it cannot with all those complications be an inflexible steel-clad tariff; there must be discretion within the proper officers of the company to consider the circumstances such as I have before detailed, and which I will not repeat, precisely as they arise."

The witness had had the number of freight transactions on the Erie road ascertained, counting each way-bill and consignee as a separate transaction, and found it to amount to 1,987,000 in one month. He did not believe that any inflexible rule could be made to govern such a number of transactions. If, at a little station on the road where regular rates have always been charged, a deposit of iron ore should be discovered, there never having been any rate on ore or pig iron from that place because there had been no occasion for any, if the existing tariffs would not permit the utilization of that ore, he would not hesitate in conferring with capitalists who purposed to establish a furnace at that place, and giving them such special rates as would enable them to compete with other furnaces elsewhere. The other people at the station would have no cause for complaint if they paid \$2 per 1,000 ft. freight on lumber while the furnace-men paid but \$1.50.

In answer to a question by the Chairman, Mr. Blanchard said that he thought there would be no objection to an open tariff if all the roads which come in competition with each other could be subjected to the same rule.

In adjusting rates for another furnace at another place, the circumstances might be so different as to make wholly different rates appropriate. In cases of this kind, the circumstances were usually reported by the local station agent, but the rates were finally made in the general freight office. On his road they had four district freight agents, who are traveling over the road constantly, and ascertain the requirements, requests and complaints of the people along the line. He had repeatedly said that the officers of the road never heard when a transaction was satisfactory to the public, and that they were paid to hear complaints. The orders to these district agents were to report in the fullest way everything that comes to their notice. He instanced one report from Binghamton which was that the Delaware, Lackawanna & Western was accepting a certain article as fourth-class, and would get all the shipments of it unless the Erie did the same. Then the question was whether, because this must be made fourth-class for Binghamton, it must be put into that class for all the other 260 stations of the road. He did not feel required to do that, but made this a special rate. He also instanced a letter from Smith & Lapham, one of the largest wholesale grocery firms in Buffalo, asking that they be given lower rates than the regular rates to Buffalo, because of their very large shipments, and because dealers at Syracuse and Rochester, they believed, were getting special rates, and threatening to patronize some other road if the request was not granted. This application was declined, as Buffalo business was pooled, and the Erie would get but 34 per cent of it in any event. But he thought it would be proper, in consideration of quantity and regularity of shipments, to make reductions of 5 to 20 per cent, from the regular rates. Being asked if greater reductions than 5 or 20, or even 50 per cent. were not made, Mr. Blanchard said not in any case that he was aware of on his road.

Another request was to make a rate of \$10 per car on hay from Cuba to Vandalia, N. Y., when the company had offered to carry it for \$14, the applicant saying that he could not ship it otherwise, and offering to sign a release if the \$10 rate was granted. There were no other shippers of hay from Cuba to Vandalia. On examination it appeared to be true that anything more than \$10 would prevent shipments, and the application was granted, but the rate on hay for similar distances everywhere was not then reduced to \$10.

Applications for modifications of rates of this kind at the general office probably averaged about 20 per day. Witness produced a blank form made for such special rates, which is filled and sent to the station agents concerned when such a rate is made. If, when a special rate is given to one person, others under like circumstances ask for it, they are granted it. Many special rates are made to enable manufacturers and others to extend their sales to points where otherwise manufacturers on other roads would furnish the supply. A rate was often given to points beyond the terminus of the road—that is, for routes partly over other roads—which yielded the road shipping less than its regular rates from the shipping point to the terminus. A tanner at a local point on the Erie from which the rate to New York is 25 cents might say that he could enlarge his business, give the road more freight in bark and green hides if the road would give him a rate of 30 cents to Boston, out of which the Erie would receive but 20 cents for carrying to New York. The railroad companies in such cases believed that, though the rate charged to the receiver of such freight in New York was more than that

charged for carrying over the same line to the citizen of Boston, yet, taking into consideration the aggregate interests of the state of New York, including the railroad company, its employees, the shipper, the men who sell bark and hides and raise cattle, the difference of five cents was not by fair interpretation a discrimination against the state of New York. On this head Mr. Blanchard submitted a paper by M. de la Gournerie, of the French Corps des Ponts et Chaussees, a translation of which, under the title, "The Principles Governing Railroad Rates," was published in the *Railroad Gazette* of June 20, 1879, page 336, saying that he knew of nothing which treated the subject so exhaustively. For practices of this kind on the road the New York leather merchants had never complained. There were forms for such rates, one when the contracts were special, one when they were general and open, and one where the charges were at regular rates and the reductions were made by rebates. On his road nine-tenths of the transactions of this kind were at open special rates. As an instance of a rebate, he submitted a voucher to H. K. & F. B. Thurber & Co., dated April 19, 1879, for what was termed an overcharge on salt from Jersey City to Corning. The Thurbers based their request for this drawback on the statement that salt was delivered at Elmira, 18 miles east of Corning, from Philadelphia at \$30 per car-load, and that the Corning merchant could not compete with the Elmira merchant in selling salt unless a drawback of 5 cents should be made from the regular rate of 20 cents per 100 lbs. on shipments from New York to Corning. The road thought this drawback justifiable to protect its interests. Inquiry was always made to ascertain the necessity of such drawbacks. If the rate had been made openly, then the Elmira merchant would have been likely to take a freight bill to the Pennsylvania office to justify a further reduction in its rate from Philadelphia.

Again, conditional drawbacks were given in cases where a manufacturer, for instance, would say that if he had a given special rate he would receive 25 car-loads of raw materials and ship 15 car-loads of manufactured product every day. The road might put in sidings for him, and while charging him regular rates agree to give him a drawback equivalent to the reduction required, if at the end of a month or other period his freight amounted to a given quantity. Again, a shipper in Buffalo when the canal rate was 8 cents per bushel might agree to ship 100,000 bushels of grain to New York by the railroad at 8½ cents. Instead of giving him a contract at that rate the railroad would be likely to contract to carry the grain at 10 cents and give the shipper a rebate of 1½ cents a bushel upon the completion of the contract. If the contract was made simply at 8½ and the canal rate should happen to fall to 6 cents, the shipper might cease shipping by rail after having forwarded but a small part of the quantity for which he had contracted. Canal rates often change within a few minutes, and the railroad cannot well follow them. Special rates were made on the canal also, as Mr. Blanchard showed by a letter from the agent of the Union Steamboat Company, which said that the regular rate by its canal line was 10 cents from New York to Buffalo, while special rates were given as low as 4½ cents. This made it appropriate to make the changes in special contracts with Buffalo merchants such that a drawback could be paid and their business held in spite of a reduction in canal rates. The credit of persons asking special rates also determined this matter sometimes. The course taken with vouchers for drawbacks was described as follows by Mr. Blanchard.

"In the first place, the notices which have been taken cognizance of by the Committee are sent to the forwarding agent, to the receiving agent and to the Auditor; upon the arrival of the way-bill—a copy of every way-bill made over the railroad passing through the Auditor's office—the way-bill is checked to see if the rate at which the station agent billed the property, and the rate at which the receiving agent collected the property, are in accordance with the advices of the authority that makes the rates; if they are found to be so, the way-bill is put one side as correct; then, at the end of the month, or other agreed period, the claimant puts in his bill for the amount of his money; that statement is accompanied with such as I read upon this voucher, showing the date, the number of the way-bill, the number of the car and the consignee and the forwarder; that voucher is then checked in the freight office; a duplicate is made by the clerk; the clerk affixes his initials to the voucher; it then passes to the Assistant General Freight Agent, who affixes his initials to the voucher; it then passes to the General Freight Agent, who affixes his full name to the voucher; it then comes to me, and all the extensions and everything else are examined in my office, whereupon I approve or certify the voucher to the General Superintendent; the General Superintendent then passes the voucher, with his approval, to the Auditor; the Auditor re-examines the extension of these vouchers; they are passed to the Auditor of Freight Rates; from the Auditor of Freight Rates to the Treasurer for payment. Those are the checks that are taken by the company to have the transaction as far as possible explained by the voucher, and the agreement itself entirely in accord, and to prevent, as between the forwarding and receiving agents, or between anybody in the freight office, any collusion by which the bill or the voucher can be made at less than the original agreement."

To show what the effect of the policy of the road had been on the industries of the country which it serves, Mr. Blanchard submitted the following statistics, which we have greatly condensed. When he came upon the road in 1872, he found a great number of special rates, more than he had ever known on the Baltimore & Ohio. To ascertain their effect he had a statement compiled in the spring of 1873 showing the number of manufacturing establishments of the various kinds on the lines of the road which were worked both in 1865 and 1873 for both of these years:

1865. 1873. Increase. P. c.

No. of establishments 1,766. 3,513. 1,747. 9.9

Stations at places on lines which the company did not have in 1865 were not included in 1873. He claimed that if the policy of the railroad had not produced this increase, it at least had not reduced the industries on the road.

Again, in the eighteen counties of the state of New York on the line of that road, the population and acreage cultivated were, by the state census, in 1865 and 1875:

1875. 1865. Increase. P. c.

Population 2,664,561 1,695,951 458,610 28.5

Acres cultivated 1,334,680 1,010,619 314,061 31.0

Meantwhile for the whole state the increase in land cultivated (plowed) was 18½ per cent.

While he did not take all the credit for this growth to the railroad management, he did take some of it.

The Baltimore & Ohio Railroad was opened to Chicago Nov. 15, 1874. The cutting of rates and discriminations in favor of shipments from the West complained of had been almost entirely introduced since that time.

Witness submitted a comparative statement of the present local rates for similar distances on the four trunk lines, made up from the official tariff sheets.

The total number of rates instanced, and the number on each road above and below the average, were:

	No. of rates.	Above average.	Below average.
Baltimore & Ohio	61	61	3
Pennsylvania	60	49	11
New York Central	94	3	62
New York, Lake Erie & Western	94	19	48

Witness also submitted a table published in the *Railway World*, of March 6, 1875, giving rates by these lines and the Grand Trunk at that time, by which it appeared that then passenger rates were lowest on the New York Central, followed in order by the Pennsylvania, the Erie, and the Baltimore & Ohio, except over 200 miles, and that freights for distances up to 150 miles were generally lowest on the Pennsylvania, but for greater distances were generally somewhat lower on the New York Central and the Erie.

Mr. Blanchard explained at some length that it was impossible to calculate exactly the cost of carrying any particular shipment, and that in making rates consideration could only be had of the general average cost of hauling on the road, and some particular circumstances affecting that transaction. Sometimes it was advisable to accept less than cost. In a recent case the Erie road was offered 50 cents per car-load for hauling Canadian iron ore from the junction with Northern Central at Elmira about a mile to the Elmira furnace, where it was to be mixed with Lake Superior ore brought from Buffalo. It was argued that it would cost but little because switching engines there could be made to do the hauling. But if the furnace went into blast the road would make a profit on bringing it Lake Superior ore and coal and carrying away pig iron. The contract was made at 75 cents, which did not pay the cost of rendering that particular service.

To show the difficulty of calculating the cost of transportation, Mr. Blanchard submitted the heads of accounts under which the expenses of the New York, Lake Erie & Western are kept, being 224 in number. To be exact, it would be necessary to find how much under each head was rightly chargeable to the transaction in question.

He submitted statements of the number of cars which could be taken in either direction in one train on different sections of his road, prepared by P. P. Wright, the Superintendent of Transportation.

Division.	Dimensions of Locomotive.			Cars in train. Drivers. No. Diam. Wght on. Cylind'rs. E'St. W'st. E'St W'st
	in.	lbs.	in.	
Western	6	54	60,000	18×24 24 20
Buffalo	8	50	98,000	20×24
Buffalo to Castile	..	..	..	33 40
Castile to Hornellsville	..	..	..	55
Niagara Falls	4	60	48,000	18×22 30 22
Rochester to Avon	4	60	48,000	18×22
Avon to Conesus	..	..	..	30 40
Conesus to Wayland	..	..	..	16
Wayland to Corning	..	..	..	25 28
Corning to Susquehanna	4	60	49,000	18×24 55 55 50 50
Susquehanna to Delaware	..	..	..	Freight. 40 42,700 18×22 150 35 65 ..
Delaware to Rochester	..	..	..	Coal. 6 54 72,000 18×24
Eastern	8	50	91,830	20×24 40 35 40

Besides, pushing engines are used to help trains up five grades.

By the use of Consolidation engines the maximum train had been increased 15 cars eastward and 17 westward on the Buffalo Division and 10 cars on the Eastern Division. On other divisions on which they have not yet been introduced trains could be increased with them 10 to 11 cars on the Western, 18 to 25 on the Niagara Falls Branch, 16 to 25 on the Rochester, 20 on the Susquehanna, and 30 to 50 on the Delaware Division.

Taking the average expense per ton per mile as a basis, the expense by the Erie and the Lake Shore between Chicago and New York was at the rate of 45.6 cents per 100 lbs. in 1870, but had been reduced in 1878 to 26.9 cents. In 1870 the average profit was 0.46 cent per ton per mile; in 1878, but 0.28 cent.

Witness read from his argument on the Reagan bill at Washington last winter to show wherein the expenses were less per ton per mile on through than on local freight, in which he said that the latter was variously estimated by experts at from 33 to 60 per cent. more than the former. The cost per ton, in cents, of handling freight on the Erie road in 1878 at the largest and smallest local stations on the different divisions was as follows:

Division.	Cost of handling in cents per ton.	
	At largest station.	At smallest station.
Western	20.4	65.8
Buffalo	36.2	136.7
Rochester	7.0	27.8
Susquehanna	31.6	436.4
Delaware	62.6	220.2
Eastern	19.8	67.3

Thus a shipment from the smallest station on the Susquehanna Division (Hooper) and the smallest on the Delaware Division (Millville) actually cost 86.62 cents per ton, or 33 cents per 100 lbs., for handling alone.

In answer to a question by the Chairman the witness said that his road never made special rates to parties outside of the state to enable them to ship goods to compete with local business. Connecting roads are not permitted to go below a certain rate to local points on the Erie.

Another member of the Committee had heard that grain from the West could be got to Port Jervis cheaper by shipping it through to Newburgh and then back to Port Jervis. Mr. Blanchard said he would not be surprised at this. Rates to Newburgh were through rates and kept down by competition, while for the protection of local grain-producers a minimum which might be above the through rate was insisted upon for Western shipments to local points.

Terminal expenses are sometimes taken into account in making rates, and where parties load or unload the cars themselves also the time they are likely to hold the cars.

With regard to the definition of "local" and "through" freight, practice differed. On the Erie the following shipments are considered "through."

Freight way-billed between western terminal stations (Salamanca, Dunkirk and Suspension Bridge) and Eastern terminal stations (New York, Jersey City, Weehawken and Oakfield) in either direction.

Freight way-billed from points on other roads to points on the Erie or vice-versa from points on the Erie to points on other roads, passing over the Erie. Freight received by lake at Buffalo is considered local. In the last fiscal year (ending Sept. 30, 1878), when 6,721,774 tons of freight were carried on the road 8.5 per cent. was company's freight, 36.6 anthracite coal, 5.8 bituminous coal, 20.7 way freight, including that to and from the lakes, and 28.4 through freight. Comparing 1875 with 1878, the percentages of the total paying freight were:

	Tons.	Revenue.	Tonnage.
	1878.	1875.	1878. 1875.
Through west	5,031	4,622	11,749 9,495
Through east	26,000	15,298	33,229 26,341
Total through	31,031	19,900	43,078 35,836
Way	22,613	18,300	37,340 26,300
Coal	46,341	61,741	17,088 34,700
Total	100,000	100,000	100,000 100,000
Total east	70,000	74,000	78,000 ..
Total west	36,000	26,000	22,000 ..

At this point Mr. Blanchard was examined with regard to

the milk business of his road, of which he had made a special investigation.

When he came to the Erie road in 1872 he found that there was a uniform rate of 55 cents per can from all stations on the line to Jersey City. No rates were made to New York, but the milkmen went over with their wagons to Jersey City and there received their cans from the milk platform.

On the 1st of May, 1879, this rate was reduced to 40 cents per can, and milk was delivered in Brooklyn for an additional amount of 2 cents per can. The 55 cent rate was maintained for cream. There has been no increase of revenue since, and at the time the evidence was given the road was carrying less milk than the year before. The nearest station at which milk is received is 27 miles and the most distant one 79 miles from Jersey City. There are special cars, special trains, special speed and special hours for milk, and special boats at night which are run at a loss. There are special employees, and the empty cans are returned free. The road has two miles of trains of eleven cars each, whose average load in 1878, was 185 cans each, of an average weight, including ice carried free, of 108 lbs., the empty cans weighing 28 lbs. This yielded for a round trip of the train \$55.05 per car, and an average of 31 cents per 100 lbs. of weight carried. The earnings per car-load of milk are not as much as the average earnings of cars carrying local freight on the Eastern Division. The Wallkill Valley road delivers more milk to the Erie than any other branch, and on this milk the Erie receives but 32 cents per can. The milk trains run 25 miles an hour between stations, and carry no passengers. Eight locomotives are engaged on these trains, five of them on branches from which 13 of the 22 miles cars hauled daily are received. There is a brakeman to each car, and a milk agent to each train to make out way-bills. A full set of extra milk-train men is kept ready to take the places of any who may be temporarily disabled. At Jersey City, there is a milk agent with three men devoted to that service. The New Jersey Midland, the New Jersey Central, and the Delaware, Lackawanna & Western charge 40 cents per can; the Long Island Railroad, 30 cents; and the Hudson River boats, 15 to 20 cents. On the Long Island Railroad, the milk is carried on a regular train that runs at hours suitable for doing other business; its average haul is 22 miles, as against 55 to 60 on the Erie, and it has no special milk stations. Mr. Vanderbilt was asked at Saratoga what the earnings of a passenger train between New York and Buffalo would be, with the intimation that the earnings of a milk train were greater. Mr. Blanchard had ascertained the earnings of a passenger train that day. They amounted to \$1,696, and for the round trip between \$3,400 and \$3,500, against an average of \$550 earned by a milk train. The following is a statement written by the New York milk agent of the method of conducting the milk traffic in detail:

"The milk is received from shippers by agents at the several stations, who make manifests in duplicate of same, one copy of which accompanies the milk; to each train on main line there is a milk agent, whose duty is to superintend the business of the train, see that manifests are properly made and that the correct number of cans are taken on board; to every milk car there is a brakeman, who receives and takes charge of the milk and makes delivery of it at Jersey City and who also receives, takes charge of and delivers the returned empty cans, which are carried back free of charge; two clerks accompany the train and, doing their work thereon, make abstracts of the milk manifests and corresponding tickets for each consignee, on which collection of the freight and delivery of the milk is made; ferry steamboats are run to accommodate this business as follows: Between foot of Chambers street, New York, and foot of Pavonia avenue, Jersey City, every thirty minutes each day from 11 a. m. to 2 a. m., and every fifteen minutes from 2 a. m. to 6 a. m.; also, from foot of Twenty-third street, New York, at 10:45 p. m. and 1:30 a. m., and returning from Jersey City at 1:30 and 3 a. m."

These boats take other traffic also; but they are specially run for the milk, and would not be run at those hours but for the milk.

Milk trains are given precedence of other trains; in 1878 they were late by 35 times at Jersey City (730 arrivals).

The state census shows an increase of 10½ per cent. in the number of cows in Orange County from 1865 to 1877, and of 58 per cent. in the quantity of milk sent to market. The branch lines from which the Erie receives most of its milk have been worked at a loss by it. Witness detailed the special constructions on the line of the road for the accommodation of the milk traffic, including a very large number of platforms, milk houses and switches.

At the beginning of his examination, Oct. 20, Mr. Blanchard submitted the following statement of the average receipt, expense and profit in cents per ton per mile on the aggregate of the railroads reporting to the New York State Engineer and Surveyor, and on the Erie Railway, for the past nine years, as follows:

Year ending Sept.	All New York roads.	Eric Railway.
Receipt, Expense, Profit.	Receipt, Expense, Profit.	Receipt, Expense, Profit.
1870..... 1,7016	1,1471	0,5545
1871..... 1,7005	1,1450	0,5555
1872..... 1,6545	1,1490	0,5055
1873..... 1,6000	1,0864	0,5136
1874..... 1,4480	0,9750	0,4730
1875..... 1,3039	0,9587	0,3452
1876..... 1,1909	0,8561	0,3043
1877..... 1,0590	0,7740	0,2850
1878..... 0,9994	0,6900	0,3694

For the total of the New York railroads the reduction from 1870 to 1878 has been 47.14 per cent. in receipts, 30.93 per cent. in expenses, and 44.22 per cent. in profits.

On the Erie the reduction from 1872 to 1878 has been 36.2 per cent. in earnings, 38.3 in expenses and 44.4 per cent. in profits.

(TO BE CONTINUED).

The Automatic Electric Block System.

[From "Notes on Railroad Accidents," by Charles Francis Adams, Jr., just published by G. P. Putnam's Sons, New York.]

A realizing sense of the necessity of ultimately adopting some system of protection against the danger of rear-end collisions was, above all else, brought directly home to American railroad managers through the Revere disaster. In discussing and comparing the appliances used in the practical operation of railroads in different countries, there is one element, however, which can never be left out of the account. The intelligence, quickness of perception and capacity for taking care of themselves—that combination of qualities which, taken together, constitutes individuality and adaptability to circumstance—very greatly among the railroad employees of different countries. The American locomotive engineer, as he is called, is especially gifted in this way. He can be relied on to take care of himself and his train under circumstances which in other countries would be thought to insure disaster. Volumes on this point were included in the fact that though at the time of the Revere disaster many of the American lines, especially in Massachusetts, were crowded with the trains of a mixed traffic, the necessity of making any provision against rear-end collisions, further than by directing those in immediate charge of the trains to keep a sharp look-out and to obey their printed orders, seemed hardly to have occurred to any one. The English block sys-

tem was now and then referred to in a vague, general way; but it was very questionable whether one in ten of those referring to it knew anything about it or had ever seen it in operation, much less investigated it. A characteristic illustration of this was afforded in the course of those official investigations which followed the Revere disaster, and have already more than once been alluded to. Prior to that disaster the railroads of Massachusetts had, as a rule, enjoyed a rather exceptional freedom from accidents, and there was every reason to suppose that their regulations were as exact and their system as good as those in use in other parts of the country. Yet it then appeared that in the rules of very few of the Massachusetts roads had any provision, even of the simplest character, been made as to the effect of telegraphic orders, or the course to be pursued by employees in charge of trains on their receipt. The appliances for securing intervals between following trains were marked by a quaint simplicity. They were, indeed, "singularly primitive," as the railroad commissioners on a subsequent occasion described them, when it appeared that on one of the principal roads of the state the interval between two closely-following trains was signaled to the engineer of the second train by a station-master's holding up to him as he passed a number of fingers corresponding to the number of minutes since the first train had gone by. For the rest the examination revealed, as the nearest approach to a block system, a queer collection of dials, sand-glasses, green flags, colored lanterns and hand-targets. The climax in the course of that investigation was, however, reached when some reference, involving a description of it, was made to the English block. This was met by a protest on the part of one veteran superintendent, who announced that it might work well under certain circumstances, but for himself he could not be responsible for the operation of a road running the number of trains he had charge of in reliance on any such system. The subject, in fact, was one of which he knew absolutely nothing; not even that, through the block system and through it alone, fourteen trains were habitually and safely moved under circumstances where he moved one. This occurred in 1871, and though eight years have since elapsed, information in regard to the block system is not yet very widely disseminated inside of railroad circles, much less outside of them. It is none the less a necessity of the future. It has got to be understood, and, in some form, it has got to be adopted; for even in America there are limits to the reliance which, when the lives and limbs of many are at stake, can be placed on the "sharp look-out" of any class of men, no matter how intelligent they may be.

The block system is of English origin, and it scarcely needs to be said that it was adopted by the railroad corporations of that country only when they were driven to it by the exigencies of their traffic. But for that system, indeed, the most costly portion of the roads of the English roads must of necessity have been duplicated years ago, as their traffic had fairly outgrown those appliances of safety which have even to this time been found sufficient in America. There were points, for instance, where 270 regular trains of one line alone passed daily. On the London & Northwestern there are more than 60 through down trains, taking no account of local trains, each day passing over the same line of tracks, among which are express trains which stop nowhere, way trains which stop everywhere, express-freight, way-freight, mineral trains and parcel trains. On the Midland road there are nearly twice as many similar trains on each track. On the Metropolitan Railway the average interval is 3½ minutes between trains. In one case points were mentioned where 270 regular trains of one line alone passed a given junction during each 24 hours—where 470 trains passed a single station, the regular interval between them being but five-eighths of a mile—where 132 trains entered and left a single station during three hours of each evening every day, being one train in 82 seconds. In 1870 there daily reached or left the six stations of the Boston roads, some 885 trains; while no less than 650 trains a day were in the same year received and dispatched from a single one of the London stations. On one single exceptional occasion, 1,111 trains, carrying 145,000 persons, were reported as entering and leaving this station in the space of eighteen hours, being rather more than a train a minute. Indeed, it may well be questioned whether the world anywhere else furnishes an illustration so apt and dramatic of the great mechanical achievements of recent times as that to be seen during the busy hours of any week-day from the signal and interlocking galleries which span the tracks as they enter the Charing Cross or Cannon street stations in London. Below and in front of the galleries the trains glide to and fro, coming suddenly into sight from beyond the bridges, and as suddenly disappearing—winding swiftly in and out, and at times four of them running side by side, on as many tracks, but in both directions—the whole making up a swiftly-shifting maze of complex movement under the influence of which a head unaccustomed to the sight, grows actually giddy. Yet it is all done so quietly and smoothly, with such an absence of haste and nervousness on the part of the stolid operators in charge, that it is not easy to decide which most to wonder at, the almost inconceivable magnitude and dispatch of the train movement, or the perfection of the appliances which make it possible. No man concerned in the larger management of railroads, who has not passed a morning in those London galleries, knows what it is to handle a great city's traffic.

Perfect as it is in its way, however, it may well be questioned whether the block system, as developed in England, is likely to be generally adopted on American railroads. Upon one or two of them, and notably on the New Jersey Central and a division of the Pennsylvania, it has already been in use for a number of years. From an American point of view, however, it is open to a number of objections. That, in itself, it is very perfect and has been successfully elaborated so as to provide for almost every possible contingency, is proved by the results daily accomplished by means of it. The English lines are made to do an incredible amount of work with comparative few accidents. The block system is, however, none the less a very clumsy and complicated one, necessitating the constant employment of a large number of skilled operators. Here is the great defect in it from the American point of view. In this country labor is scarce and capital costly. The effort is always toward the perfecting of labor-saving machines. Hitherto, the pressure of traffic on the lines has not been greater than could be fairly controlled by simpler appliances, and the expense of the English system is so heavy that its adoption, except partially, would not have been warranted. As Barry says in his treatise on the subject, "one can buy gold too dear;" for if every possible known precaution is to be taken regardless of cost, it may not pay to work a railway at all."

It is tolerably safe, therefore, to predict that the American block system of the future will be essentially different from the present English system. The basis—electricity—will of course be the same; but, while the operator is everywhere in the English block, his place will be supplied to the utmost possible degree by automatic action in the American. It is in this direction that the whole movement since the Revere disaster has been going on, and the advance has been

* An excellent popular description of this system will be found in Barry's "Railway Appliances," Chapter V.

very great. From peculiarities of condition also the American block must be made to cover a multitude of weak points in the operation of roads, and give timely notice of dangers against which the English block provides only to a limited degree, and always through the presence of yet other employés. For instance, as will presently be seen, many more accidents and, in Europe even, far greater loss of life is caused by locomotives coming in contact with vehicles at points where highways cross railroad tracks at a level therewith than by rear-end collisions; meanwhile throughout America, even in the most crowded suburban neighborhoods, these crossings are the rule, whereas in Europe they are the exception. The English block affords protection against this danger by giving electric notice to gatemen; but gatemen are always supposed. So also as respects the movements of passengers in and about stations in crossing tracks as they come to or leave the trains, or prepare to take their places in them. The rule in Europe is that passenger crossings at local stations are provided over or under the tracks; in America, however, almost nowhere is any provision at all made, but passengers, men, women and children, are left to scramble across tracks as best they can in the face of passing trains. They are expected to take care of themselves, and the success with which they do it is most astonishing. Having been brought up to this self-care for their lives, they do not, as would naturally be supposed, become confused and stumble under the wheels of locomotives; and the statistics seem to show that no more accidents from this cause occur in America than in Europe. Nevertheless some provision is manifestly desirable to notify employés as well as passengers that trains are approaching, especially where way-stations are situated on curves.

Again, it is well known that, next to collisions, the greatest source of danger to railroad trains is due to broken tracks. It is, of course, apparent that tracks may at any time be broken by accident, as by earth-slides, derailment or the fracture of rails. This danger has to be otherwise provided for; the block has nothing to do with it further than to prevent a train delayed by any such break from being run into by any following train. The broken track which the perfect block should give notice of is that where the break is a necessary incident to the regular operation of the road. It is these breaks which, both in America and elsewhere, are the fruitful source of the great majority of railroad accidents, and draw-bridges and switches, or facing-points, as they are termed in the English reports, are most prominent among them. Wherever there is a switch the chances are that in the course of time there will be an accident.

Four matters connected with train movement have now been specified, in regard to which some provision is either necessary or highly desirable; these are rear collisions, tracks broken at draw-bridges or at switches, highway grade crossings and the notification of agents and passengers at stations. The effort in America, somewhat in advance of that crowded condition of the lines which makes the adoption of something a measure of present necessity, has been directed toward the invention of an automatic system which at one and the same time should cover all the dangers and provide for all the needs which have been referred to, eliminating the risks incident to human forgetfulness, drowsiness and weakness of nerves. Can reliable automatic provision thus be made? The English authorities are of opinion that it cannot. They insist that "if automatic arrangements be adopted, however suitable they may be to the duties which they have to perform, they should in all cases be used as additions to, and not as substitutions for, safety machinery worked by competent signal-men. The signal-man should be bound to exercise his observation, care and judgment, and to act thereon; and the machine, as far as possible, be such that if he attempts to go wrong it shall check him."

It certainly cannot be said that the American electrician has as yet demonstrated the incorrectness of this conclusion, but he has undoubtedly made a good deal of progress in that direction. Of the various automatic blocks which have now been experimented with or brought into practice, the Hall Electric and Union Safety Signal Company systems have been developed to a very marked degree of perfection. They depend for their working on diametrically opposite principles; the Hall signals being worked by means of an electric circuit caused by the action of wheels moving on the rails, and conveyed through the usual medium of wires; while, under the other system, the wires being wholly dispensed with, a continuous electric current is kept up by means of the rails, which are connected for the purpose, and the signals are then acted upon through the breaking of this normal circuit by the movement of locomotives and cars. So far as the signals are concerned, there is no essential difference between the two systems, except that Hall supplies the necessary motive force by the direct action of electricity, while in the other case dependence is placed upon suspended weights. Of the two the Hall system is the oldest and most thoroughly elaborated, having been compelled to pass through that long and useful tentative process common to all inventions, during which they are regarded as of doubtful utility and are gradually developed through a succession of partial failures. So far as Hall's system is concerned, this period may now fairly be regarded as over, for it is established use on a number of the more crowded roads of the North, and especially of New England, while the imperfections necessarily incident to the development of an appliance at once so delicate and so complicated have for certain purposes been clearly overcome. Its signal arrangements, for instance, to protect draw-bridges, stations and grade-crossings are wholly distinct from its block system, through which it provides against dangers from collision and broken tracks. So far as draw-bridges are concerned, the protection it affords is perfect. Not only is its interlocking apparatus so designed that the opening of the draw blocks all approach to it, but the signals are also reciprocal; and if through carelessness or automatic derangement any train passes the block, the draw-tender is notified at once of the fact in ample time to stop it.

In the case of a highway crossing at a level, the electric bell under Hall's system is placed at the crossing, giving notice of the approaching train from the moment it is within half a mile until it passes; so that, where this appliance is in use, accidents can happen only through the gross carelessness of those using the highway. When the electric bell is silent there is no train within half a mile, and the crossing is safe; it is not safe while the bell is ringing. As it now stands, the law usually provides that the prescribed signals, either bell or whistle, shall be given from the locomotive as it approaches the highway, and at a fixed distance from it. The signal, therefore, is given at a distance of several hundred yards, more or less, from the point of danger. The electric system improves on this by placing the signal directly at the point of danger—the traveler approaches the bell, instead of the bell approaching the traveler. At any point of crossing which is really dangerous, that is, at any crossing where trees or cuttings or buildings mask the railroad from the highway, this distinction is vital. In the one case notice of the unseen danger must be given and cannot be unobserved; in the other case, whether it is really given or not, may depend on the condition of the atmosphere or the direction of the wind.

Usually, however, in New England, the level cross-

ings of the more crowded thoroughfares, perhaps, one in ten of the whole number, are protected by gates or flag-men. Under similar circumstances in Great Britain there is an electric connection between a bell in the cabin of the gate-keeper and the nearest signal boxes of the block system on each side of the crossing, so that due notice is given of the approach of trains from either direction. In this country it has heretofore been the custom to warn gate-keepers by the locomotive whistle, to the intense annoyance of all persons dwelling near the crossing, or to make them depend for notice on their own eyes. Under the Hall system, however, the gate-keeper is automatically signaled to be on the lookout, if he is attending to his duty; or, if he is neglecting it, the electric bell in some degree supplies his place, without releasing the corporation from its liability. In America the heavy fogs of England are almost unknown, and the brilliant head lights, heavy bells and shrill high whistles in use on the locomotives would at night, it might be supposed, give ample notice to the most careless of an approaching train. Continually recurring experience shows, however, that this is not the case. Under these circumstances the electric bell at the crossing becomes not only a matter of justice almost to the employé who is stationed there, but a watchman over him.

This, however, like the other forms of signals which have been referred to, is, in the electric system, a mere adjunct of its chief use, which is the block—they are all as it were things thrown into the bargain. As contradistinguished from the English block, which insures only an unoccupied track, the automatic blocks seek to insure an unbroken track as well—that is, not only is each segment into which a road is divided protected as respects following trains by, in the case of Hall's system, double signals watching over each other, the one at safety the other at danger—both having to combine to open the block—but every switch or facing point, the throwing of which may break the main track, is also protected. The Union Signal Company's system, it is claimed, goes still further than this and indicates any break in the track, though due to accidental fracture or displacement of rails. Without attempting this, the Hall system has one other important feature in common with the English block, and a very important feature, that of enabling station agents in case of sudden emergency to control the train movement within a half a mile or more of their stations on either side. Within the given distance they can stop trains either leaving or approaching. The inability to do this has been the cause of some of the most disastrous collisions on record, and notably those at Revere and at Thorpe.

The one essential thing, however, in every perfect block system, whether automatic or worked by operators, is that in case of accident or derangement or doubt, the signal should rest at danger. This the Hall system now fully provides for, and in case even of the willful displacement of a switch, an occurrence by no means without precedent in railroad experience, the danger signal could not but be displayed, even though the electric connection had been tampered with. Accidents due to willfulness, however, can hardly be provided for except by police precautions. Train-wrecking is not to be taken into account as a danger incident to the ordinary operation of a railroad. Carelessness or momentary inadvertence, or, most dangerous of all, that recklessness—that unnecessary assumption of risk somewhere or at some time, which is almost inseparable from a long immunity from disaster—these are the great sources of peril most carefully to be guarded against. The complicated and unceasing train movement depends upon many thousand employés, all of whom make mistakes or assume risks sometimes; and did they not do so they would be either more or less than men. Being, however, neither angels nor machines, but ordinary mortals whose services are bought for money at the average market rate of wages, it would certainly seem no small point gained if an automatic machine could be placed on guard over those whom it is the great effort of railroad discipline to reduce to automatons. Could this result be attained, the unintentional throwing of a lever or the carelessness which leaves it thrown would simply block the track instead of leaving it broken. An example of this, and at the same time a most forcible illustration of the possible cost of a small economy in the application of a safeguard, was furnished in the case of the Wollaston disaster. At the time of that disaster the Old Colony Railroad had for several years been partially equipped on the portion of its track near Boston, upon which the accident occurred, with Hall's system. It had worked smoothly and easily, was well understood by the employés, and the company was sufficiently satisfied with it to have even then made arrangements for its extension. Unfortunately, with a too careful eye to the expenditure involved, the line had been but partially equipped; points where little danger was apprehended had not been protected. Among these was the "Foundry switch," so called, near Wollaston. Had this switch been connected with the system and covered by a signal-target, the mere act of throwing it would have automatically blocked the track, and only when it was re-set would the track have been opened. The switch was not connected, the train-hands were recklessly careless, and so a trifling economy cost in one unguarded moment some fifty persons, life and limb, and the corporation more than \$300,000.

One objection to the automatic block is generally based upon the delicacy and complicated character of the machinery on which its action necessarily depends; and this objection is especially urged against those other portions of the Hall system, covering draws and level crossings, which have been particularly described. It is argued that it is always liable to get out of order from a great multiplicity of causes, some of which are very difficult to guard against, and that it is sure to get out of order during any electric disturbance; but it is during storms that accidents are most likely to occur, and especially is this the case at highway grade-crossings. It is comparatively easy to avoid accidents so long as the skies are clear and the elements quiet; but it is exactly when this is not the case, and when it becomes necessary to use every precaution, that electricity as a safeguard fails or runs mad, and, by participating in the general confusion, proves itself worse than nothing. Then it will be found that those in charge of trains and tracks, who have been educated into a reliance upon it under ordinary circumstances, will from force of habit, if nothing else, go on relying upon it, and disaster will surely follow.

This line of reasoning is plausible, but none the less open to one serious objection; it is sustained neither by statistics nor by practical experience. Moreover, it is not new, for, slightly varied in phraseology, it has been persistently urged against the introduction of every new railroad appliance, and, indeed, was first and most persistently of all urged against the introduction of railroads themselves. Pretty and ingenious in theory, practically it is not feasible!—for more than half a century this formula has been heard. That the automatic electric signal system is complicated, and in many of its parts of most delicate construction, is undeniable. So also is the locomotive. In point of fact, the whole railroad organization from beginning to end—from machine-shop to train-movement—is at once so vast and complicated, so delicate in that action which goes on with such velocity and power, that it is small cause for wonder that in the beginning all plain, sensible, practical men scouted it as the fanciful creation of visionaries. They were wholly justified in so do-

ing; and to-day any sane man would of course pronounce the combined safety and rapidity of ordinary railroad movement an utter impossibility, did he not see it going on before his eyes. So it is with each new appliance. It is ever suggested that at last the final result has already been reached. It is but a few years, as will presently be seen, since the Westinghouse brake encountered the old "pretty and ingenious" formula. Going yet a step further, and taking the case of electricity itself, the bold conception of operating an entire line of single-track road wholly as respects one-half of its train movement by telegraph, and without the use of any time-table at all, would once have been condemned as mad. Yet to-day half of the vast freight movement of this continent is carried on in absolute reliance on the telegraph. Nevertheless it is still not uncommon to hear among the class of men who rise to the height of their capacity in themselves being automation superintendents that they do not believe in deviating from their time-tables and printed rules; that, acting under them, the men know or ought to know exactly what to do, and any interference by a train-dispatcher only relieves them of responsibility, and is more likely to lead to accidents than if they were left alone to grope their own way out.

Another and very similar argument frequently urged against the electric, in common with all other block systems, by the large class who prefer to exercise their ingenuity in finding objections, rather than in overcoming difficulties, is that they breed dependence and carelessness in employés; that engine-drivers accustomed to rely on the signals, rely on them implicitly, and get into habits of recklessness, which lead inevitably to accidents, for which they then contend the signals, and not they themselves, are responsible. This argument is, indeed, hardly less familiar than the "pretty and ingenious" formula just referred to. It has, however, been met and disposed of by Captain Tyler, in his annual reports to the Board of Trade, in a way which can hardly be improved upon:

"It is a favorite argument with those who oppose the introduction of some of these improvements, or who make excuses for the want of them, that their servants are apt to become more careless from the use of them, in consequence of the extra security which they are believed to afford; and it is desirable to consider seriously how much of truth there is in this assertion. * * * Allowing to the utmost for these tendencies to confide too much in additional means of safety, the risk is proved by experience to be very much greater without them than with them; and, in fact, the negligence and mistakes of servants are found to occur most frequently, and generally with the most serious results, not when the men are over-confident in their appliances or apparatus, but when, in the absence of them, they are habituated to risk in the conduct of the traffic. In the daily practice of railway-working station-masters, porters, signal-men, engine-drivers or guards, are frequently placed in difficulties, which they have to surmount as best they can. The more they are accustomed to incur risk in order to perform their duties, the less they think of it, and the more difficult it is to enforce discipline and obedience to regulations. The personal risk which is encountered by certain classes of railway servants is coming to be more precisely ascertained. It is very considerable; and it is difficult to prevent men who are in constant danger themselves from doing things which may be a source of danger to others, or to compel them to obey regulations for which they do not see altogether the necessity, and which impede them in their work. This difficulty increases with the want of necessary means and appliances; and it diminishes when, with proper means and appliances, stricter discipline becomes possible, safer modes of working become habitual, and a higher margin of safety is constantly preserved."⁴

In Great Britain the ingenious theory that superior appliances or greater personal comfort in some indefinable way leads to carelessness in employés was carried to such an extent that only within the last few years has any protection against wind, rain and sunshine been furnished on locomotives for the engine-drivers and stokers. The old stage-coach driver faced the elements, and why should not his successor on the locomotive do the same? If made too comfortable, he would become careless and go to sleep! This was the line of argument advanced, and the tortures to which the wretched men were subjected in consequence of it, led to their fortifying nature by drink. They had to be regularly inspected and examined before mounting the foot-board, to see that they were sober. It took years in Great Britain for intelligent railroad managers to learn that the more protected and comfortable a man is, the better he will attend to his duty. And even when the old argument, refuted by long experience, was at last abandoned as respected the locomotive cab, it, with perfect freshness and confidence in its own novelty and force, promptly showed its brutal visage in opposition to the next new safeguard.

For the reasons which Captain Tyler has so forcibly put in the extracts which have just been quoted, the argument against the block system from the increased carelessness of employés, supposed to be induced by it, is entitled to no weight. Neither is the argument from the delicacy and complication of the automatic electric signal system entitled to any more, when urged against that. Not only has it been too often refuted under similar conditions by practical results, but in this case it is based on certain assumptions of fact which are wholly opposed to experience. The record does not show that there is any peculiar liability to railroad accidents during periods of storm; perhaps because those in charge of train movements or persons crossing the tracks are under such circumstances more especially on the lookout for danger. On the contrary, the full average of accidents of the worst description appears to have occurred under the most ordinary conditions of weather, and usually in the most unanticipated way. This is peculiarly true of accidents at highway grade-crossings. These commonly occur when the conditions are such as to cause the highway travelers to suppose that, if any danger existed, they could not but be aware of it. In the next place, the question in regard to automatic electric signals is exactly what it was in regard to the Westinghouse brake, with its air-pump, its valves and connecting tubes—it is the purely practical question—Does the thing work? The burden of proof is properly on the inventor. The presumption is all against him. In the case of the electric signals, they have for years been in limited but constant use, and while thus in use they have been undergoing steady improvement. Though now brought to a considerable degree of comparative perfection, they are, of course, still in their earlier stage of development. In use, however, they have not been found open to the practical objections urged against them. At first much too complicated and expensive, requiring more machinery than could by any reasonable exertions be kept in order and more care than they were worth, they have now been simplified until a single battery properly located can do all the necessary work for a road of indefinite length. As a system, they are effective, and do not lead to accidents; nor are they any more subject than telegraph wires to derangement from atmospheric causes. When any disturbance does take place, until it can be overcome it amounts simply to a general signal for operating the road with extreme

caution. But with railroads, as everywhere else in life, it is the normal condition of affairs for which provision must be made, while the dangers incident to exceptional circumstances must be met by exceptional precautions. As long as things are in their normal state, that is, probably during nineteen days out of twenty, the electric signals have now through several years of constant trial proved themselves a reliable safeguard. It can hardly admit of doubt that in the near future they will be both further perfected and generally adopted.

THE SCRAP HEAP.

Using Old Rails.

The Virginia & Truckee Railroad is utilizing its old rail-roads for fence posts. The bars are cut into equal lengths of about seven feet, then three holes are drilled in them about a foot apart. They are sunk $2\frac{1}{2}$ ft. into the ground and Glidden's barbed wire is strung on them and securely fastened at the holes. The fence is to all intents and purposes, indestructible, and there is not the trouble from snow and drifting sand which board fences cause.

A Terrible Ride.

A railroad accident occurred on Veta Mountain, Friday, by which Pat McCool lost his life, and which resulted in the demolition of several freight cars and a caboose. The train was cut at the little station at Sangre del Cristo Creek, on the west side of the Sangre del Cristo range, being too heavy for the engine to take up the grade. The first half was switched on the summit, and the engine started to return for the purpose of bringing up the rear cars. As the engine started back, the forward gear eccentric broke, totally disabling the left side, while the strain on the machinery threw the lifter on the right side out of shape, thus putting the locomotive entirely beyond the control of the engineer. There was nothing to control it by. Realizing at once the impending danger, the engineer told the fireman and brakeman to jump off, and began to whistle off-brakes to the conductor and brakeman on the train down the mountain. The engine was then about three-quarters of a mile from the rear part of the train, its rate of speed in descending increasing every moment. The men below did not understand the signal, and it was not till the engine was within one-quarter of a mile from the cars that the danger was observed. The conductor hurried the passengers out of the caboose and let off the brakes. All the persons on the train got off except a drunken laborer named Pat McCool. He refused to move, and there was no time to move him by force, so the caboose and cars, the brakes being let loose, darted down the mountain, pursued by the flying engine. Behind the caboose, and of course in front of the train as it shot down the mountain, were two hand-cars. Going round the curve at Sangre del Cristo tank, the grade being 217 feet to the mile and the momentum very rapid, the hand-cars left the track and ditched the caboose, the freight cars pushing hard behind, swinging the caboose around and passing by, going into the ditch beyond and on the other side. This left the caboose half on the track and only partly on its side. The engine came tearing along at a terrible speed, and, when about forty yards from the caboose, the engineer jumped off, followed by the fireman and brakeman, who until then refused to leave him. Just at this moment the drunken laborer came staggering out on the rear platform of the caboose, and was crushed between the engine and the caboose into an almost unrecognizable mass. —*Denver (Col.) Tribune.*

Causes of Accidents to Employes.

No reference is intended to that class of accidents called "catastrophes," such as collisions of trains, breaking of bridges, track obstructions, and other sources of injury to many at once, but those minor casualties that occur in freight yards and about switches, and usually affect no one but the individual whose negligence, or recklessness, or misfortune puts him in peril. There are few of these, however, that are not the result of the sufferer's fault rather than his mischance. In a recent conversation with Mr. Averill, the Yard Master of the Vandalia road, a *News* reporter was shown some of the means of mischief, and the way in which the danger might be reduced.

1. Stepping on the cowcatcher or bench in front of a moving engine. Occasionally experienced railroad hands are killed or maimed for life by this always dangerous performance. The slightest slip of the foot, or mistake of time or of the speed of the engine, is very nearly as certain death as a bullet through the head. "But," says Mr. Averill, "the hands will do it, in spite of warnings and threats of dismissal, because it is an easy way to get to the place they want to go to, and appears to be easy and safe to do. When an accident happens in this way there is no one to blame but the victim."

2. In coupling cars, particularly at night, there is often danger of the coupler's foot catching in the space between the rail and the "guard rail," opposite a "frog," and being held till the car rolls over it and crushes it. A half a second is long enough to do the mischief; and in the dark the coupler, running along with the moving train, and necessarily near the two cars to be coupled or cut apart, cannot see the "guard rail," or guess what danger he is in till he finds his heel or toe caught for one fatal instant.

3. Sometimes couplers are caught between the bumpers, and have a hand or arm, or even the body crushed, and sometimes they may stumble against a projecting tie and be thrown off their balance.

4. Many accidents are caused by the improper position of the ladder on a freight car, by which the brakeman climbs from the ladder to the roof. When it is set beside the car door, the distance on the roof from the place where the brakeman mounts to the brake wheel at the end of the car, is considerable, and if the roof is icy or slippery there is danger of falling off in getting over that distance. When the ladder is at the end of the car the iron stirrup in which the foot is first set in mounting, is put on the side of the car, and this compels the brakeman to swing round the corner with one foot at the end and one on the side, and this is often a trying and perilous position, which Mr. Averill thinks might be remedied to some extent by carrying the ladder straight up the side of the car from the iron stirrup.

5. The "rungs" of the ladder and the stirrup get loose, or are made of wood get rotten, or the screens come out, or they are made unsafe by inadequate care in some way. "And a fall is rather more likely than not to throw the brakeman under the wheels."

6. Jumping from one freight car to another, when the train is in motion, is obviously very dangerous, for a fall is almost invariably fatal, and a fall may come, if there is the slightest slip, misstep or miscalculation. But this is one of the things that a brakeman must do frequently, and so far, there appears to be no sufficient means of reducing the necessity or the danger of it.

Mr. Sayres, who has charge of the making-up of trains in the Vandalia yard, once told the reporter, in a half jesting way, that when the freight yard was crowded and a great deal of shifting and "cutting" coupling had to be done, it was as dangerous to a green hand as going into a battle. It certainly looks so to an outsider.—*Indianapolis News.*

⁴ Reports: 1872, page 23, and 1873, page 39.



Published Every Friday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

CONTENTS.

	Page.
ILLUSTRATIONS:	
Hall's Automatic Railroad	599
Signals	590, 591
EDITORIALS:	
Railroad Signals	594
Railroad Manslaughter	595
The Great Western, of Canada	595
The Future of the Pacific Railroads	595
Draw-bridge Accidents	596
The Rise in Prices of Railroad Stocks	596
Record of New Railroad Construction	596
EDITORIAL NOTES:	596
GENERAL RAILROAD NEWS:	
Meetings and Announcements	597
Elections and Appointments	597
Personal	598
Traffic and Earnings	598
GENERAL RAILROAD NEWS:	
Railroad Law	599
The Scrap Heap	593, 599
Old and New Roads	599
ANNUAL REPORTS:	
Boston, Revere Beach & Lynn	601
Grand Trunk	601
Great Western, of Canada	602
Boston & Albany	602
East Tennessee, Virginia & Georgia	602
Memphis & Charleston	602
Connecticut River	602
MISCELLANEOUS:	
Hall's Automatic Electric Railroad Signals	589
Mr. G. R. Blanchard's Testimony before the New York Investigating Committee	590
The Automatic Electric Block System	592

EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN OPINIONS, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

RAILROAD SIGNALS.

The imperfections and defects of the systems of railroad signals at present in use in this country would appear almost absurd, if we will imagine the kind of a report which an enlightened commissioner from some foreign country—China for example—would be compelled to make if sent over here by the governing powers of the Flowery Kingdom to examine into such matters here. We can imagine the kind of description which he would write of our railroads: that they consist of wagons which run on two parallel iron bars at a very high rate of speed, which is extremely dangerous; that terrible accidents are of frequent occurrence, in which large numbers of persons are crushed to death in the most horrible manner; that trains of these wagons frequently run off from the iron bars and are dashed to pieces against rocks or by falling from high embankments or down the sides of mountains, or crush each other to pieces by coming into collision. He would say that such roads frequently cross each other, and are constructed with an ingenious arrangement by which one train of wagons can be conducted from one track to another; that there are many bridges across navigable streams which are arranged so as to swing and open the water channel for vessels to pass across the iron track; that these bridges are sometimes left open when a train is approaching the stream, and that horrible accidents have happened, in which many persons have been killed and wounded. That some roads are built with one line of iron bars only, and that on these roads run in opposite directions, and thus, through mistakes, often run into each other; that on other roads two lines of track are used, on one of which trains run in one way, and on the other one in the opposite direction; that in such cases moving trains sometimes run into others which are standing still, and that fast trains are liable to overtake slow ones. Obstructions are sometimes either willfully or unwittingly placed in the way of trains, so that they are dashed to pieces by coming in contact with such obstacles. The steam wagons are so constructed that it is impossible to direct them into any given path un-

less the track is first prepared for them to run on. One set of men is employed to arrange the iron bars, the bridges, etc., so as to make a line or path for the steam wagons. It is therefore of the utmost importance that the persons who have charge of the path should be able to communicate with those who run the steam wagons, and thus indicate to them when everything is prepared and it is safe to go ahead, and when they must stop. It is very singular, though, that while all the appliances for running the steam wagons at the dangerous speed at which the people of this Western nation are constantly traveling are developed in the most ingenious and wonderful manner, yet the beacons or the means employed to show when danger exists, are of a very imperfect form, and often of a confusing and even contradictory character. In other words, these vigorous people of the West show wonderful ability in incurring danger, but much less in avoiding or preventing it. In day time, to indicate to the man who runs the steam wagon that it is safe to proceed, all kinds of disks, balls, arms, banners, flags, etc., are displayed. In running over some of the roads, the man who has the care of the steam wagon must constantly exercise the greatest vigilance in observing a variety of such signals, some of which mean that he must stop, others that the way is clear, and still others that it is not quite certain whether the way is clear or not, but that the train may move on and take the risk. The signals on one road are quite unlike those on other roads, and a signal on one line sometimes means just the reverse of what it does on another, and occasionally it is found that at one end of a road a given signal means that the line is safe and the train may go ahead, and at the other end the same signal means that there is danger and the train must stop.

Dropping our Chinese personality, it may be added that while in the signals employed in day-time the greatest variety, and even confusion, exists, those employed at night are almost the same every where, and are generally of the most exact and definite character. A red light almost universally means danger, and when displayed at a switch, a crossing, a junction, bridge, or other place of danger, it almost universally means stop. In day-time, however, as has already been pointed out, disks and targets of every variety of form and proportion are used at switches, and the signals employed at bridges and crossings seem to have taxed the ingenuity of those who have designed them, in order to discover new forms and methods of conveying one and the same meaning at various places. Now, the singular feature is, that while it is found to be entirely practicable to operate a road at night with two or at most with three signals on nearly all lines, so many different kinds of signals are used in day-time. At night a red light always means danger and stop, and is usually the only fixed signal which is used for that purpose. The question might then be asked, why not employ some one signal to be used for the same purpose in day-time. If one kind of target is then required at switches, a flag or "banner" at signal stations, a ball or semaphore at crossings and something else at bridges, why is not the same diversity needed at night? If the one simple signal will answer at a time when all objects are obscured in darkness, it is hard to understand why an equally simple and definite one would not answer just as well in day-time when at least some sources of danger are visible.

The messages which a person in charge of the track, whether signalman, switchman, bridge or crossing tender, have are either, "Line clear, GO AHEAD," "Line obstructed, STOP," or that other ambiguous and consequently hazardous signal called "CAUTION," but which in reality, if the signalman should express its meaning clearly would be, "You may go ahead, although I am not sure whether the line is clear or not; therefore go cautiously, because great all is dangerous." Each of these three signals is given at night by one and the same means, that is, a white, red, green or blue light. Of the wisdom of using the latter signal at all, there will perhaps always be a question, the answer to which will depend very much upon the number of the trains on the road, and their weight and speed. Such a signal necessarily contains the elements of danger, and a system in which it is employed cannot be absolutely perfect. Experience has clearly indicated that on a road with many trains running at a high rate of speed such a signal is dangerous. If it is excluded, there would then be but two signals employed, which would mean "GO AHEAD" and "STOP." Now, why not adopt some one form of signal, which shall be used in day-time in all locations, as a red light is at night, to indicate "STOP," and another signal to indicate "GO AHEAD." If this were done, it would at once simplify the whole system, and this simplicity

would diminish the liability of accident from failure to observe signals. If a system is employed, in which this, that and another signal all mean "Stop," it is lacking in definiteness. If the engineer of a steamboat, who cannot see danger ahead but is governed entirely by signals from the pilot, had two or three or half a dozen different bells, all of which meant "Stop," under different circumstances, it is evident that it would often be confusing to him. The same principle, although perhaps to a less degree, applies when a variety of signals is used for the observance of a locomotive runner.

If, then, some common danger signal should be used, the question will arise, what shall it be. Without intending to re-open the disputed question of color-blindness, there can be no doubt of the fact that there are persons who cannot distinguish a red target or flag from a green one under certain conditions of light; and even with the most sensitive power of recognizing colors, it is often difficult to tell the color of a disk or banner of a signal at a long distance, or in certain conditions of the atmosphere, or with the sun in some one position in relation to the signal. Therefore, if a signal must be recognized by its color, it is always attended by an element of danger which would be entirely eliminated if its position indicated its meaning. It may be said that under any circumstances night signals must be recognized by their color. Although it would be possible to devise a system of signals by which the position and not the color of night lights would determine their meaning, yet, as at present employed, it is true that they must be recognized by their color. But this is not nearly so difficult as it is to discern the color of an imperfectly illuminated target or a banner signal behind a glass with the sun shining on it at some angle so as to produce a reflection. In other words, there is less danger of not recognizing a signal light by its color at night than there is with day-light signals. Even if there were not, if the position of day-light signals determine their meaning, one element of danger will be eliminated during more than half the time. But in any event, position and color may both be used in day signals, thus combining whatever elements of safety there may be in each.

Attention has been called in these pages a number of times heretofore to what is considered the great superiority of semaphore signals to all other forms. By a semaphore signal is meant one which consists of a post, of any height suitable to its location, and one or more arms five or six feet long and one foot wide pivoted at one end to the post so that they can be raised at right angles to the latter or lowered to any inclination, or so that they will hang down alongside or behind the post. Examples of such signals, in which the whole construction was designed with consummate skill by Messrs. Saxby & Farmer, the English signal engineers, were illustrated in the *Railroad Gazette* of Oct. 4, 1878.

Perhaps as strong an argument as could be used in favor of semaphore signals is that they have almost entirely displaced all other fixed signals in England. It is believed, too, that such a signal will arrest the attention of a person approaching it quicker than any other form, partly for the reason that its position is analogous to the natural gesture of holding out the right arm when a person wishes to arrest the attention or movements of another.

There is no reason now for thinking or hoping that any movement, which is likely to accomplish the purpose, will be made for some years to come to adopt any uniform system of signals in this country, and in the absence of any authority to enforce its use, probably none ever will be adopted, unless it is brought about by the gradual introduction of some system which, by its superiority to all others, will thus commend itself to the managers of different lines, until it is so generally employed as to induce all other lines to use it for that reason. The only hope, therefore, is to introduce the best form of signal, which, it is believed, is the semaphore. On the New York Central & Hudson River line, all the main-line switches are being equipped with two semaphore signals, one at a distance of 1,500 ft. from the switch, and the other a home signal in the same posture usually occupied by a switch target. The switch and the distance signal are each worked by a separate lever with a simple interlocking apparatus connected therewith, so that it is impossible to move the switch to connect with the turn-out without first raising the distance signal to indicate danger, nor is it then possible to lower the distance signal to indicate "line clear" until after the switch is moved back to connect the main track.

The object of this article is to direct the attention of railroad managers to the superiority of semaphore over all other forms of signals. There is not room here to speak of the advantages of interlocking signals, excepting to say that the use of the simple contrivance

which is now being put down on the New York Central line would doubtless have prevented the late lamentable accident at Jackson, and also the still later one on the Greenwood Lake Railroad near New York.

RAILROAD MANSLAUGHTER.

Until very recently, little disposition has been shown to enforce the penalties of manslaughter against managers of trains whose misconduct or neglect of duty leads to fatal casualties. Actions for damages have been numerous; criminal prosecutions have been very few, or very little known. Even the action for damages has been but lately allowed. Formerly a person injured, but surviving, could maintain suit against the responsible author of his injury; but if he died, the right to sue was considered as dying with him; his family had no redress. Statutes of comparatively recent date have, however, relieved this defect in the law, in most of the states. Where they prevail the representatives of a person killed by railroad negligence may recover, within limits, damages for the loss his family sustain. This remedy is most advantageous and just, as toward those who immediately lose by the death; but it fails, in important respects, to protect the public fully. The action for damages is not even aimed at the persons actually in fault, and if it nominally strike the directors, they suffer naught, but toss the missile along to the stockholders. The actual, ultimate effect of a verdict is to reduce dividends and thus mulct the stockholders, who were in no respect in fault, either for neglect of duty, or, except very indirectly, for employing unsuitable agents. Again, the action for damages is liable to be met by the defense that the passenger was also negligent. It is often frustrated by proof of this sort, which is a reason why no award of damages should be made, but seems not to be a reason why the general public should not have the protection of some legal rebuke to every instance of culpable neglect of duty, causing loss of life. Hence, it is well that in recent instances of grossly negligent collisions, the criminal law has been invoked. In Massachusetts early in the present year, a conductor of the Old Colony Railroad has been tried and convicted of manslaughter for his inexcusable omission to send a danger signal, as prescribed by the rules of the company. The consequence of his neglect was the collision at Wollaston, in which many lives were lost. It is understood that his case has been carried before the full bench of judges and is awaiting review. In the case of the very recent collision in New Jersey, a similar line of action is indicated; the managers of the train chiefly in fault for the disaster, have been indicted by the grand jury, and will probably be put on trial very soon.

Very few instances are known of prosecutions of this kind. One is remembered. It grew out of a casualty in Newark, in 1865. The switch-tender neglected to adjust a switch, a train was thrown from the track, and a passenger killed. The switch-tender was convicted; and the court explained that the law does not require any positive act, or any malicious intention, to render a person chargeable with manslaughter; a culpable omission or gross neglect of duty is enough, if a death is caused.

Abundant support is, however, found in decisions of English courts, for this view of the law, whether in application to railroads, or to other forms of dangerous machinery. Undoubtedly, in any attempt to apply them to instances arising in this country, regard must be had to the way in which the offense may be defined in the statute law of the particular state where the disaster occurs. There is an act of Congress, passed before the era of locomotives, which applies the law of manslaughter to persons in charge of steamboat boilers; but no national law exists as to railroads. But the general idea includes, as is well understood, causing death by culpable neglect or omission of any specific known duty; and there is no good reason why railroad management should be excepted.

Note, therefore, what has occurred in England. As long ago as 1848 there was a prosecution of a signalman on the Great Western Railway. The charge showed that certain signals were provided, and definite rules given for using them, and that he was employed to give them, and ought to have signaled an obstruction of the line. He failed to do so, and passengers were killed. The court ruled that this was a clear case of manslaughter. A similar instance arose in 1864 on the Southeastern Railway. There was need to take up and relay certain rails. While this work was in progress it was the duty of an inspector under general employment for such service to see that signals were stated along the line, to prevent any train approaching. By accident or inadvertence the inspector looked at the wrong page in the company's book of time-tables, and thus was misled as to the hour when a train might be expected; and did not put out

the signals in season. Result: a train dashed unexpectedly upon the broken spot in the track, was thrown off, and eleven persons were killed. The inspector was convicted. His lawyers objected that if the flagman and engineer had kept faithful look-out, the casualty would have been averted notwithstanding his default; but the judges said their neglect was no excuse for his. It was enough that he had had a plain book of directions and had read it carelessly, and so had caused a fatal accident.

It is worth observing, in behalf of employés, that, to expose them to this liability, the rule of duty must be plain and practicable, and the neglect unquestionable and gross. An error of judgment in honestly striving to carry out instructions which are of doubtful meaning will not expose an agent to this criminal liability. If the directions issued by the company are wrongly framed, the fault is with the directors or officers by whom they were made. On the Southwestern Railway trains were at one time arranged to run within five minutes of each other. There were "general rules" about signals to prevent collisions, but they were contradicted by "special rules" on the same subject. There was also a regulation that engines should never be run tender foremost; but no turn-table was provided by the company, on one branch, and when an engineer was returning from a trip over that, he was obliged to run tender foremost. An engine thus running backward came in collision with a train, and five persons were killed. The engine-driver and fireman were tried, but the judge and jury all agreed that the fault did not lay with them, but with the direction, for running trains so near together, and prescribing contradictory and impracticable directions.

Whether directors can be charged criminally for want of proper general arrangements and instructions does not appear to be settled. Probably making arrangements and giving directions which were injudicious would not warrant accusation of manslaughter; but neglect to provide any would have a different aspect.

The Great Western of Canada.

The Great Western report is for the period from Feb. 1 to July 31, and illustrates as no other report does the effect of the enormous east-bound through traffic done during those six months, almost entirely at extremely low rates. The effect, however, is not fully shown by a comparison with the corresponding half-year of 1878, because the course of business then was almost precisely parallel—an enormous traffic, with rates beginning very low in February, and growing lower and lower nearly till the end of July, only in 1879 the rates went lower in the latter part of the half-year than in 1878. The Great Western shows a reduction of 4.6 per cent. in gross and of 8 per cent. in net earnings this year compared with last, and as the interest charges and losses on leased lines have increased, the result is materially worse: in 1878, the fixed charges exceeded the net earnings by £1,731; in 1879 by £10,172. The amount of deficit is not very great, and has doubtless been more than made up by profits on the current half-year's business. It is interesting, however, as showing what the effect of the competition for east-bound traffic has been on a road whose traffic is chiefly through. But, as we have said, the comparison of the results for the past two years does little toward this. We therefore look further back, and give the receipts, expenses and net earnings of this road for the corresponding half years (ending with July) for twelve years past, covering the most prosperous as well as the least prosperous periods of its existence:

Half year ending July 31.	Gross earnings.	Expenses.	Net earnings.
1868	£3,649	£208,461	£148,188
1869	385,067	232,767	152,300
1870	408,860	251,823	157,076
1871	458,890	268,275	190,615
1872	550,734	329,436	220,298
1873	619,839	417,069	202,740
1874	553,257	425,303	127,954
1875	411,187	571,365	39,822
1876	394,769	290,647	104,122
1877	370,514	275,716	94,798
1878	383,460	291,167	92,293
1879	365,771	275,896	84,875

It should be borne in mind that the system owned by the company has nearly doubled in length during the twelve years, and since 1873, when the gross earnings were greatest, it has increased from 438 to 486 miles, so that the gross earnings per mile for the half-year have fallen from £1,415 to £753 per mile, and the net earnings per mile have fallen since 1872 from £503 to £175. We know nothing which shows so strikingly the great reduction in rates and especially in profits on the through traffic. For, except in passenger traffic, the through business of the Great Western in the last half-year was, doubtless, larger than in any previous corresponding half-year. The trouble has been not a want of business, but unprofitable rates, leaving this road, with its larger mileage, with but 38½ per cent. of

the net earnings that it had in 1872. And the most discouraging fact of all, perhaps, is the continuance of the decrease. Ever since it began, in 1874, every half-year has shown smaller gross earnings than the corresponding half-year of the previous year. If we were to take this half of the year by itself we might conclude that there was no hope for the road—that it was falling into a bottomless pit. But no correct idea of the financial condition of the property can be had from the returns of this half-year. It is always the bad half-year, and it has been especially so in the last three years—in 1877 very light traffic and low rates; in 1878, very heavy traffic and shamefully low rates; in 1879, still heavier traffic and still lower rates—rates that much of the time did not begin to pay expenses. But the second half of the year has been favorable in the last two of these years, and this year, doubtless, most of all; and taking these half-years (ending with February), the result is not wholly discouraging of late, as the figures below will show:

Half-year ending with February	Receipts.	Expenses.	Net earnings.
1876	£436,087	£309,507	£126,520
1877	401,628	313,715	87,913
1878	467,257	317,604	149,633
1879	387,295	255,794	131,501

Thus the last half-year (ending July 31, 1879) shows 35½ per cent. less profits than the preceding half-year, when traffic was not much larger, but rates were better. So the first half of 1878 shows 38 per cent. less profits than the preceding half-year, though there was a very heavy traffic in the first half of 1878.

What is encouraging is the possibility of the road's making respectable profits over its fixed charges whenever there is a good traffic and fair rates, as in the two last fall halves. The good prospect of maintaining fair rates through the first of the year also, which we now have, makes it reasonable to expect that hereafter this road's profits may be nearly as great in the first as in the last half of the year. It probably will profit more, in proportion to its total profits, by the maintenance of through rates than any other railroad in America save the Canada Southern, for the reason that a larger proportion of its business is through freight. It, too, may profit more than most roads by the maintenance of passenger rates, because its through passenger traffic is exceptionally large.

In this connection it may be mentioned that the President and two of the directors of this company have been for several days negotiating with the officers of the Michigan Central, the Canada Southern and other companies concerning a division of traffic for a considerable period. We understand that at this time an arrangement has been practically agreed upon, though the contract may not yet be signed. One of the things provided for in it is a freight line over the two Canada lines and the Wabash. The Great Western hitherto has not been able to get traffic from the Wabash, but it has got a good deal of St. Louis and other southwestern business by way of the Michigan Central and Joliet, which, we believe, it did not divide with the Canada Southern under the Scott award. The new arrangement, it appears, is intended to cover the whole of the through traffic, and to make the interests of the two roads, so far as this traffic is concerned, absolutely identical, or at least prevent any danger of conflict; but as its terms are not yet fully known, and perhaps not even fully settled, we cannot vouch for this. We may be sure, however, that the Great Western has not got a share of the Wabash traffic without giving something in return. But this is one of the cases where both parties to the bargain may gain largely by it.

The Future of the Pacific Railroads.

In a communication to *The Nation*, occasioned by some comments of that journal on the Supreme Court's decision concerning the validity of the Thurman act, Mr. C. P. Huntington, the Vice-President of the Central Pacific Company, objects to the assumption that the Pacific railroad companies have ever denied the obligation of their dues to the government or have ever sought to evade the payment of the debt. The roads, he says, were not in default, and were themselves the first to propose that some sinking fund be created to meet their obligations to the government when they should become due. Because they object to a particular method of meeting those obligations prescribed by Congress, which they believed to be injurious and unjust to them, it should not be supposed that they did not intend to pay them at all.

It must be said, however, that there were some dangers in allowing the corporations to continue their course, making such disposition as they pleased of their profits, and trusting solely to the then value of the property as security of the debt which will be due in the latter part of this century. This debt, if not provided for in part beforehand, would amount to something like \$45,000,000 for the Central Pacific and as much for the Union Pacific at the time it became due, and it would not be the first lien, but a second lien on the property, the first-mortgage bonds of about \$25,000,000 preceding them. Now it is by no means certain that these roads will be

worth \$70,000,000 apiece, or anything like it, twenty years from now. It would not be at all strange if at that time they could be replaced for \$30,000 per mile; but, however that may be, they will be certain to lose their command of their Pacific traffic long before that time. There will be at least two additional lines, and likely enough half a dozen, by that time. Very likely—almost certainly, we should say—local traffic will grow so that there will be more traffic per road than the Pacific roads now have; but the trouble is that then, probably, the roads will have to compete with each other for traffic, as roads further east now do, and instead of getting three cents per ton per mile on an average for carrying freight, they may be glad to get half that, which would still be twice as much as some Eastern railroads have had to accept of late years. Instead of earning 7 per cent. on \$100,000 per mile, as they have done sometimes, they might not be able to earn that interest on more than \$30,000 per mile, and then be as well off as a great many railroads in this country, which are thought very tolerable properties. We do not mean to say that so large a reduction of profits is probable, but it is possible; and if it should occur, the roads might go to satisfy their first-mortgage bondholders.

Naturally, we should expect the present line across the continent to remain permanently the great trunk line of a wide district on each side of it, and the more so because of the unproductive character of a large part of that country. If it were all as fertile as Iowa, before the close of this century there would be parallel lines on each side of it within 30 miles, and one of these, or of other parallel lines, might have a larger share of the through traffic and more branches than the Union and Central Pacific line. But the districts which attract population are isolated, and they can get communication with the world much easier through a branch of the existing line than by making one through to the Missouri on the East or the Pacific on the West. So we find already two lines running south from the Union Pacific into Colorado and one to the north to Montana and quite a little system to the south in Utah, besides several short lines further east; while there are several branches of the Central Pacific in Nevada, to say nothing of its great system of feeders in California. All this makes it improbable that this line will ever be crowded by parallel roads in such a way as to affect ordinary local traffic greatly. But a line 300 miles away will compete successfully for what promises to be the bulkiest product of the country through which these roads run—cattle; and the through traffic and the business of such important districts as that about Denver, are likely to be divided among several roads and may be much less profitable than now, even when they are several times as large.

Draw-bridge Accidents.

The occurrence of an accident at the Hackensack River on the New York & Greenwood Lake Railroad by an engineer's running his train into an open draw-bridge, on which, it is reported, the regular signals were displayed, has led some newspapers to demand the extension to New Jersey of the Connecticut law requiring every train to come to a full stop before crossing a draw-bridge, under all circumstances. In his just-published book, "Notes on Railroad Accidents," Mr. Adams traces the origin of this law to the terrible Norwalk accident in 1853, when 46 persons were killed and some 30 injured. Illustrating the subject further he instances the still more terrible accident on the Grand Trunk in 1864, at the Belceil bridge, in which 86 persons were killed and hundreds injured—chiefly immigrants. But Mr. Adams has no faith in the stop as a preventive. He says:

"These terrible disasters were both due, not alone to the carelessness of the two engine-drivers, but to the use of a crude and inadequate system of signals. It so happened, however, that the Legislature of Connecticut was unfortunately in session at the time of the Norwalk disaster, and consequently the public panic and indignation took shape in a law compelling every train on the railroads of that state to come to a dead standstill before entering upon any bridge in which there was a draw. This law is still in force, and from time to time, after the New Hamburg catastrophe, an unreasoning clamor is raised for it in other states. In point of fact it imposes a most absurd, unnecessary and annoying delay on travel, and rests upon the Connecticut statute book a curious illustration of what usually happens when legislators undertake to incorporate running railroad regulations into the statutes at large. It is of par with another law, which has for more than 25 years been in force in Connecticut's sister state of Massachusetts, compelling, in all cases where the tracks of different companies cross each other at a level, the trains of each company to stop before reaching the crossing, and then to pass over it slowly. The danger of collisions at crossings is undoubtedly much greater than that of going through open draws. Precautions against danger in each case are unquestionably proper, and they cannot be too perfect, but to have recourse to stopping either in the one case or the other simply reveals an utter ignorance of the great advance which has been made in railroad signals and the science of interlocking. In both these cases it is, indeed, entitled to just about the same degree of respect as would be a proposal to recur to pioneer engines as a means of preventing accidents to night trains."

It is a curious fact that neither at grade crossings nor at draws has the mere stopping of trains proved a sufficient protection. Several times in the experience of Massachusetts roads have those in charge of locomotives, after stopping and while moving at a slow rate of speed, actually run themselves into draws with their eyes open, and afterward been wholly unable to give any satisfactory explanation of their conduct. But the insufficiency of stopping as a reliable means of prevention was especially illustrated in the case of an accident which occurred upon the Boston & Maine Railroad on the morning of the 21st of November, 1832, when the early local passenger train was run into the open draw of the bridge almost at the entrance to the Boston station. It so happened that the train stopped at the Charlestown station just before going into the bridge, and at the time the accident occurred was moving at a speed scarcely faster than a man could walk; and yet the locomotive was entirely submerged, as the water at that point is deep, and the only thing which probably saved the train was that the draw was so narrow and the cars were

so long that the foremost one lodged across the opening, and its forward end only was beneath the water. At the rate at which the train was moving the resistance thus offered was sufficient to stop it, though, even as it was, no less than six persons lost their lives and a much larger number were more or less injured. Here all the precautions imposed by the Connecticut law were taken, and served only to reveal the weak point in it. The accident was due to the neglect of the corporation in not having the draw and its system of signals interlocked in such a way that the movement of the one should automatically cause a corresponding movement of the other; and this neglect in high quarters made it possible for a careless employé to open the draw on a particularly dark and foggy morning, while he forgot at the same time to shift his signals."

And in his chapter on "Interlocking," Mr. Adams says:

"So superior is this apparatus in every respect—as regards safety as well as convenience—to the precaution of coming to a stop, that, as an inducement to introduce an almost perfect scientific apparatus, it would be very desirable that states like Massachusetts and Connecticut compelling the stop should except from the operation of the law all drawbridges or grade crossings at which suitable interlocking apparatus is provided."

The Rise in Prices of Railroad Stocks.

We copy from the *American Exchange* of Nov. 2, the following tabular statement of the prices of stocks on the New York Stock Exchange at the beginning and end of the month of October, and the advances during September, October and the two months:

	Opening Oct.	Closing Oct.	31.	Total value two months ...	Number of shares sold in October.	Inc. or Dec. P.c.
Canada Southern	69 1/2	73 1/2	4	11 1/2	15 1/2	37,900
C. C. & I. C. C.	57 1/2	60	11 1/2	18 1/2	66,315	1878.
Ches. & Ohio	115 1/2	151 1/2	3 1/2	89 1/2	80,237	1875.
Chic. St. Paul & Minn.	59 1/2	13 1/2	4	3	55,249	Inc. or Dec. 1.3
Chic. & North-western	45 1/2	45 1/2	0	17 1/2	26,400	1875.
Chic. M. & St. Paul	89 1/2	90	6 1/2	75 1/2	87,225	1875.
Dela. Lack. & Western	67 1/2	74 1/2	6 1/2	5 1/2	547,038	1875.
Delaware & Hudson	67 1/2	88 1/2	21 1/2	12 1/2	980,280	1875.
Hannibal & St. Jo.	59 1/2	79	18 1/2	15	187,656	1875.
Hannibal & St. Jo., pref.	94 1/2	36 1/2	12 1/2	5 1/2	177,637	1875.
Ind. C. & L. Fayette	53 1/2	60 1/2	7	12 1/2	87,152	1875.
Kans. Pacific	7	10 1/2	3 1/2	3	152,850	1875.
Kansas Pacific	70	84 1/2	14 1/2	15	37,351	1875.
Louisville & Nashville	62 1/2	79 1/2	13 1/2	8	76,106	1875.
Lake Shore	63	101	0	6 1/2	461,478	1875.
Manhattan Rail-way	44 1/2	57 1/2	13 1/2	...	43,466	1875.
Metropolitan Rail-way	110	123	13	...	8,854	1875.
Michigan Central	89	93 1/2	4 1/2	10	152,814	1875.
Mo., Kansas & Texas	20 1/2	28 1/2	8 1/2	6 1/2	479,059	1875.
Morris & Essex	93 1/2	100 1/2	7 1/2	3 1/2	80,687	1875.
Nash. Chat. & St. L.	45	58 1/2	18 1/2	7 1/2	63,381	1875.
New Jersey Central	60 1/2	77 1/2	17 1/2	10 1/2	535,443	1875.
N. Y. Cent. & Hudson R.	111 1/2	130	10 1/2	3 1/2	10,747	1875.
New York Elevated	121	131	10	3 1/2	10,492	1875.
N. Y. L. E. & Western	33	40 1/2	7 1/2	9 1/2	2,970,072	1875.
N. Y. L. E. & W., pref.	57	65	8	12 1/2	102,396	1875.
Northern Pacific	23	30	13	6 1/2	114,804	1875.
Northern Pacific, pref.	49	60 1/2	11 1/2	4 1/2	153,319	1875.
Ohio & Mississippi	103 1/2	23 1/2	4	3 1/2	208,255	1875.
St. L. Kan. C. & N.	24 1/2	44 1/2	20	3 1/2	212,919	1875.
St. L. Kan. C. & N., pref.	60	69 1/2	9 1/2	5	168,082	1875.
St. L. & S. Francisco	19 1/2	27	7 1/2	7 1/2	32,288	1875.
St. L. & S. Francisco, 1st pref.	21 1/2	33 1/2	11 1/2	4 1/2	74,130	1875.
St. L. & S. Francisco, 1st pref.	40 1/2	54	7 1/2	6	22,691	1875.
St. L. I. M. & Southern	43 1/2	40 1/2	5 1/2	10 1/2	176,590	1875.
Union Pacific	84 1/2	91 1/2	6 1/2	6 1/2	194,446	1875.
Wabash	43 1/2	50 1/2	16	6 1/2	458,084	1875.
Gold and Stock Telegraph	90	105	15	...	1,106	1875.
Western Union	94 1/2	105 1/2	10 1/2	2 1/2	421,990	1875.
Pacific Mail	29 1/2	37 1/2	8 1/2	10 1/2	430,110	1875.
All other stocks					1,319,077	1875.
Total number of shares sold					\$11,526,000	1875.

More than half of these stocks—22 out of 41—never have paid dividends, or have not for many years. The advance in price of the New York, Lake Erie & Western alone for the two months was 70 per cent. on the common, and 47 per cent. on the preferred, amounting, for the whole amount outstanding, to about \$14,500,000. But while the holder of Erie common has made 70 per cent. on his money in the two months, the holder of Columbus, Chicago, & Indiana Central has made 130 per cent.; of Indianapolis, Cincinnati & La Fayette, 162 per cent.; of Missouri, Kansas & Texas, 100 per cent.; of Northern Pacific common, 113 per cent.; of St. Louis, Kansas City & Northern common, 112 per cent.; of St. Louis & San Francisco common, 125 per cent. People who hold such stuff as New York Central have had to be contented with an advance of about 9 per cent.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

St. Paul, Minneapolis & Manitoba.—The Branch Line is extended from Tumuli, Minn., west by north, to St. Olof, 9 miles.

St. Louis & San Francisco.—This company's Kansas Divi-

sion is extended from Cherryvale, Kan., westward to Neodesha, 14 miles.

Bellefonte & Eldorado.—Extended from Benton, Ill., westward to Duquoin, 18 miles.

Kansas Pacific.—The track of the Solomon Branch is extended from Delphos, Kan., north by west to Beloit, 24 miles.

Valley of Ohio.—Extended northward into Cleveland, O., 22 miles.

Bellair & Southwestern.—Extended from Beallsville, O., southwest to Jerusalem, 4 1/2 miles. Gauge, 3 feet.

Baltimore & Hanover.—Extended southward to Emory Grove, Md., 6 miles, completing the road.

St. Joseph & Des Moines.—Extended northeast to Albany, Mo., 12 miles. Gauge, 3 feet.

Minneapolis & St. Louis.—Extended from Nunda, Minn., southwest to Lake Mills, Ia., 10 miles.

This is a total of 119 1/2 miles of new railroad, making 2,859 miles thus far this year, against 1,724 miles reported for the corresponding period in 1878, 1,824 in 1877, 1,913 in 1876, 1,080 in 1875, 1,524 in 1874, 3,130 in 1873, and 6,106 in 1872.

THE NATURE OF THE GROWTH OF TRUNK LINE TRAFFIC was shown in a very interesting way in a table submitted by Mr. Blanchard in his evidence before the Assembly Investigating Committee. On the Erie road, it seems, from 1875 to 1878, while the total through freight traffic (tonnage mileage) increased from 51.56 to 57.96 per cent. of the whole (coal not included), there was a decrease in the percentage of through west-bound from 11.98 to 9.81, while the through east-bound increased from 39.58 to 48.15 per cent. of the whole.

Taking the actual amounts of traffic (tonnage mileage) which these percentages show, the figures are as follows:

	1878.	1875.	Inc. or Dec. P.c.
Through west.	120,150,000	121,790,000	D. 1,640,000 1.3
Through east.	589,724,000	402,300,000	I. 186,364,000 46.3
Way.	247,525,000	154,000,000	I. 93,525,000 60.6
Coal.	207,365,000	338,468,000	D. 71,103,000 20.6

Total.... 1,224,704,000 1,016,618,000 I. 208,146,000 20.5

Thus we see that there was an actual decrease in the through traffic west-bound, while the through east-bound increased to the enormous extent of nearly one half. But what would seem most astonishing of all, if we did not know the peculiar way in which traffic is defined in this statement, is the vast increase of 60 per cent. in "way" traffic at a time when Eastern industries were generally prostrate. But Mr. Blanchard's testimony given with the statement expressly declared that all the lake business—the receipts from vessels and the deliveries to them at Buffalo—were included in the "way" traffic. Now Lake Erie is the most important single connection of the New York, Lake Erie & Western Railroad, and the traffic done in connection with it for the most part passes over the whole length of the road from Buffalo to New York. It can be considered "local" only because it is a traffic for which the Erie does not depend upon any other railroad, but is practically independent, though it is in the highest degree competitive, as the railroad competes for it, and it is nearly all done at through rates. There can be no doubt but that the chief part of the increase of the "way" traffic consisted of lake business, so that the increase of the traffic of this road was almost wholly in traffic for which it competes and which it carries at through rates, as has been the case generally on the trunk lines, and pretty much all Eastern railroads until quite recently. This is further indicated by the earnings from freight; for, while there was an increase of 20 1/2 per cent. in freight traffic in the three years, there was a decrease of 3 per cent. in freight earnings. The average rates on east-bound through freight fell from 0.805 to 0.673 cent per ton per mile, and notwithstanding an increase of 46 per cent. in the amount of that traffic, the earnings from it increased only from about \$3,604,000 to \$3,972,000, or about 10 per cent.

The decrease in coal on this road does not represent a tendency: 1878 was an exceptionally bad coal year—a year when the production was smaller than for many years.

THE RAILROAD OIL TRAFFIC seems finally doomed. Not that there will not always be a vast traffic in the distribution of refined oil, which will take care of itself very well, and probably command pretty good rates everywhere, but that the enormous traffic in carrying crude oil to the refining centres at Cleveland and Pittsburgh and to the sea-ports whence oil is exported will henceforth go mostly by pipe-lines. This has long been indicated, and probably has had a good deal of effect in rates, as the railroads naturally desired to keep this great traffic as long as possible. The completion of the Tidewater Pipe-Line a few months ago was, however, the first practical step toward diverting this traffic from the railroads. Apparently, its effect so far has been to compel the railroads to carry to the sea-board at unprofitable rates, apparently on the supposition that the pipe-line would get tired of the business at such rates, and agree to an advance which would yield the railroads some profit. But the force of gravitation has worked in favor of the pipe-line, its working expenses are insignificant, and while the extremely low rates might not yield any profit on the investment in it, they were likely, at least, to cover expenses. Then a few days ago it was announced that the Standard Oil Company itself would lay a pipe-line from its refineries in Cleveland to the oil regions, thus cutting off an enormous traffic which has hitherto been carried over two or three railroads. And now it is said that the railroads refuse longer to carry for the Standard Company at the rates made to compete with the Tidewater Pipe-Line, probably recognizing that success in that contest is hopeless. It has always seemed probable

that the Standard Company would sooner or later have a line of its own. One from the wells to Cleveland is more important to it than one to the sea-board, and, moreover, will serve as part of a line from Cleveland to the sea-board. It may not be necessary, for the present, for it to construct a line to the sea-board, but that is what may be looked for eventually, we think. Meanwhile the railroads will probably try to make something on the business while it is left to them. It has been enormous in bulk, sometimes quite profitable, and often quite the reverse. But probably no trunk line will suffer so much from the loss of the oil shipments to the sea-board as will some of the roads which carry from the oil regions to Cleveland.

THE TESTIMONY OF MR. G. R. BLANCHARD, Assistant to the President of the New York, Lake Erie & Western Railroad, given before the Assembly Investigating Committee at its recent session in New York, will fill about 550 pages of the reports of the evidence—octavo pages about as large as those of most railroad companies' reports. A very large portion of this evidence consists of statements of facts, either experiences of the witness in his career as a traffic-manager, or statistics and other information which he has been able to command. Many of the facts respecting traffic and traffic management have been hard to get at. They are familiar to a comparatively small class of men, and are not much discussed by them publicly, so that this testimony of Mr. Blanchard's has a peculiar interest. It is of such enormous bulk, however, that it is a great labor to go through with it; the form of examination seems not to have conducted to clearness and concision of statement. We have waited for the *verbatim* reports before attempting to make any presentation of this testimony, not so much because the newspaper reports were not full enough, but to insure accuracy and avoid entirely omitting essential portions of the evidence, which often has to be done in the rapid and brief abstracts made for the daily papers.

What we publish this week is an abstract of considerably less than one-half of the whole testimony. The aim in it has been to give a concise statement of principal *facts* brought forward by Mr. Blanchard, with very little regard to his language or the order of his statements or illustrations, and with very slight mention, and often none at all, of arguments made by him. Occupying probably not one-tenth of the space of the original, of course it cannot pretend to completeness, but we believe that it will be found of permanent value to all who study traffic questions, especially if they have no access "behind the scenes" in a railroad office.

THE KANSAS PACIFIC'S DEBT TO THE GOVERNMENT seems to have been considered not worth legislating about at the time Congress passed the Thurman bill establishing the method of payment of its advances to the Union and Central Pacific. It had so long failed to pay the interest of the prior liens that perhaps it was supposed that the government's claim never could be paid. But the greatly improved earnings of the road for some time past, and especially the great appreciation in the prices of its stocks as well as its bonds, calls to mind the fact that the government advanced this company \$6,303,000, which debt is secured on 394 miles of the road from Kansas City west, and that at the end of June last there was a balance of \$2,100,000 due it on account of interest paid on these bonds. This is a debt that will go on accumulating like the other Pacific railroad debts, and promises to amount, principal and interest together, to something like \$12,000,000 when it is due, near the close of this century. When the road becomes able to pay dividends, very likely Congress will require it to do something to provide for paying this debt.

THE ROBBING OF RAILROAD TRAINS we had supposed to be a peculiarly American industry. But an Italian railroad journal, the *Monitore della Strada Ferrata*, notes that in one of the last nights of September about a dozen rascals brought a train to a halt on the Sicilian railroads between Catania and Caltanissetta. By chance one of the cars was occupied by a detachment of soldiers going to relieve a garrison, and the robbers, catching sight of their arms, took to flight immediately. It was too dark to pursue them, but the soldiers sent a few bullets after them before the train went on its way.

WATER RATES have fluctuated somewhat during the week ending with Wednesday last. Lake rates are about half a cent lower, quotations generally being 7 cents for corn and 7½ cents for wheat from Chicago and Milwaukee to Buffalo, going as low as 6½ for corn in one or two cases. Canal rates have been steady at 8 cents for corn and 10 for wheat from Buffalo to New York. Ocean rates have advanced again, and were quoted Wednesday by steam from New York to Liverpool at 7½ d. to 8½ d. per bushel for grain, there being little change in other freights, the demand being chiefly for grain.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows: *James River & Kanawha Canal*, annual meeting at the office in Richmond, Va., Nov. 12.

Southern Minnesota, adjourned special meeting, in La Crosse, Wis., Nov. 19.

Railroad Conventions.

The next meeting of the *Western Association of General Passenger and Ticket Agents* will be held at the Pacific Hotel, St. Joseph, Mo., on Tuesday, Nov. 11, at 11 o'clock a.m. Members are earnestly requested to be present, as it is expected that several matters of importance, discussed at the recent meetings of the *National and Central Associations*, will be acted upon.

Dividends.

Dividends have been declared as follows: *New York, Providence, & Boston*, 2 per cent., quarterly, payable Nov. 10.

Pennsylvania, 2½ per cent., semi-annual, payable Nov. 29. The company paid 2 per cent. last May, and 2 per cent. last November, previous to which no dividend had been paid since May, 1877.

Catavissa leased to *Philadelphia & Reading*, 3½ per cent., semi-annual, on the preferred stock, payable Nov. 1.

North Pennsylvania (leased to *Philadelphia & Reading*), 1½ per cent., quarterly, payable Nov. 27.

Pullman Palace Car Co., 2 per cent., quarterly, payable, Nov. 11.

Cedar Rapids & Missouri River leased to *Chicago & Northwestern*, 1 per cent., quarterly, payable Nov. 1.

Cincinnati, Sandusky & Cleveland, 3 per cent., semi-annual, on the preferred stock, payable Nov. 1.

Concord, 5 per cent., semi-annual, payable Nov. 1.

Connecticut River, 4 per cent., semi-annual, payable Jan. 1.

West Jersey, 2 per cent., payable Nov. 17. This is the first dividend since August, 1877.

Mail Service Extensions.

Mail service has been ordered over railroad lines as follows:

Burlington, Cedar Rapids & Northern.—Service ordered over *Iowa City Division* from Ossian, Ia., by *Iowa City* to *Riverside*, 25.12 miles, from Nov. 17.

St. Paul & Sioux City.—Service ordered over *St. Paul* Branch from *Lake Crystal*, Minn., by *Garden City*, *Vernon Centre* and *Winnebago City* to *Blue Earth City*, 34.81 miles, from Nov. 17. Also over *Rock River Branch*, from *Laverne*, Minn., by *Ash Creek* and *Rock Rapids* to *Doon*, Ia., 28.95 miles, from Nov. 17.

Foreclosure Sales.

The *Atlantic & Gulf* road was sold in *Savannah*, Ga., Nov. 4, under a decree of foreclosure granted by the United States Circuit Court, and was bought for \$300,000 by *H. B. Plants*. The sale was made subject to prior mortgages amounting to \$2,710,000 in all; it wipes out the stock and about \$850,000 of the funded debt. It included the whole property of the company, the main line from *Savannah* to *Bainbridge*, and the *Junction*, *Florida* and *Albany* branches, 350 miles of road in all.

So much of the *Chicago & Lake Huron, Western Division*, as lays in *Indiana*, was sold in *Indianapolis*, Nov. 1, under a decree of foreclosure granted by the United States Circuit Court, and bought for \$200,000 and the Receiver's debts, by a committee representing the bondholders and the *Grand Trunk Company*. The sale included the 58 miles of the old *Peninsular* road from *Valparaiso*, Ind., to the *Michigan* line; the bonds especially secured on this portion of the line were \$1,800,000 in amount. This sale, when confirmed by the Court, will complete the transfer of the *Chicago & Lake Huron* road to the new *Northwestern Grand Trunk Company*.

The *Cincinnati, Wabash & Michigan* road was sold at *Wabash*, Ind., Nov. 5, and bought by *J. H. Wade*, of *Cleveland*, O., for account of the bondholders. The road extends from *Goshen*, Ind., to *Anderson*, 110 miles, and had a bonded debt of \$2,000,000.

The *Des Moines, Winterset & Southwestern* road was sold in *Des Moines*, Ia., Oct. 23, under a decree of foreclosure granted by the United States Circuit Court in 1876. Bought for \$620,299.35, for account of the *Iowa Southern & Missouri Northern Company*, which owns nearly all the *Rock Island's* leased lines west of the *Mississippi*. The road extends from *Somerset Junction*, Ia., to *Winterset*, 26 miles, and has always been worked by the *Rock Island*.

The *Covington, Columbus & Black Hills* road was sold recently under a decree of the United States Circuit Court, and bought for \$64,000 by *Mr. E. F. Drake*, President of the *St. Paul & Sioux City Company*, for account of that company. The road is of 8 ft. 6 in. gauge, and is completed from *Covington*, Neb., to *Fonca*, 26 miles. It is said that the purchaser will change it to standard gauge, and will extend it westward, if local aid is offered.

The sale of the *New York & Oswego Midland* road has again been postponed from Oct. 31 to Nov. 14, at *Middletown*, New York.

Ohio & Mississippi Mutual Aid & Benefit Association.

The second annual meeting of this Association was held in *Vincennes*, Ind., Nov. 2, some 700 members being present. Several important changes were made in the constitution and an additional trustee for each division chosen. It was stated that the Association numbered about 1,000 members. The sum of \$5,762.50 was paid out for disability and sick benefits last year.

ELECTIONS AND APPOINTMENTS.

Atchison, Minneapolis & Saline Valley.—The directors of this new company are: *R. M. Pomeroy*, *W. F. Downs*, *J. W. McFallon*, *L. W. Burton*, *P. McDonald*, *G. H. Wilkes*, *J. H. Crump*, *David Turner*, *John Henry*, *J. P. Cummings*, *D. Hoag*, *R. F. Bryant*, *G. M. Lutes*.

Central Iowa.—*Mr. M. C. Healion* has been appointed Auditor, *pro tem.*, in place of *Mr. N. McFetridge*, resigned.

Cincinnati, Sandusky & Cleveland.—At the annual meeting in *Sandusky*, Oct. 15, the following directors, one-third of the board, were chosen: *J. D. Chamberlain*, *Sandusky*, O.; *J. H. Thomas*, *Springfield*, O.; *George Wilshire*, *Cincinnati*. The board reflected *John S. Farlow*, President; *N. W. Peirce*, Vice-President; *J. L. Moore*, Secretary and Treasurer.

Columbus, Springfield & Cincinnati.—This company has elected *John S. Farlow*, President; *J. D. Farnsworth*, Vice-President; *J. L. Moore*, Secretary and Treasurer. The road is leased to the *Cincinnati, Sandusky & Cleveland*.

Danbury & Norwalk.—The directors have reelected *Roswell P. Flower*, President; *James W. Hyatt*, Vice-President; *H. Williams*, Secretary and Treasurer; *L. W. Sandiforth*, Superintendent.

Denver, South Park & Pacific.—Ticket reports should be addressed to *Charles Wheeler*, Auditor, *Denver*, Col.; remittances of balances made to and drafts for balances drawn on, *C. B. Kountze*, Treasurer, at the same place.

Denver Union Depot Co..—This company has been organized with the following officers: President, *W. S. Cheeseman*; Vice-President, *S. T. Smith*; Secretary, *D. C. Dodge*; Treasurer, *G. W. Kassler*.

Grand Trunk.—*Mr. J. A. Moore* is appointed Assistant General Freight Agent in charge of the *Port Huron* and *Michigan District*.

Green Bay & Minnesota.—The following circular is dated *Green Bay*, Wis., Nov. 1:

"Mr. Robert F. Nathan having resigned his position of Assistant General Passenger Agent of this road, *Mr. Munson T. Case* has been appointed General Passenger Agent.

He will have full charge of the Ticket and Passenger departments. All correspondence in relation to passenger business will be directed to him at *Green Bay*, Wisconsin."

Hannibal & St. Joseph.—At the annual meeting in *Hannibal*, Mo., Nov. 3, the following directors were chosen: *H. H. Cook*, *Wm. Dowd*, *Jay Gould*, *Julius Hallgarth*, *Horace Porter*, *Elihu Root*, *Russell Sage*, *New York*; *Enoch Pratt*, *Baltimore*. *Messrs. Gould*, *Root*, *Sage* and *Pratt* are new directors, succeeding *S. P. Armour*, *M. P. Bush*, *Wm. S. Bliss*, *E. A. Buck* and *W. P. Leonard*, there being one director less than last year.

Hanover Branch.—At the annual meeting in *Hanover*, Mass., last week, the following directors were chosen: *E. G. Perry*, *Albert Culver*, *Washington Read*, *Richmond J. Lane*, *L. C. Waterman*. The board elected *E. G. Perry* President; *Albert Culver*, Treasurer; *C. T. Phillips*, Clerk.

Higginsville, Holden & Ft. Scott.—This company was recently organized at *Holden*, Mo., by the election of the following directors: *H. J. Higgins*, *H. S. Smith*, *J. Starkey*, *F. B. Hayes*, *T. J. Tygard*, *M. S. Cowles*, *S. A. Day*, *B. J. Waters*, *J. W. Heyman*, *M. B. Underwood*, *J. H. Parker*, *C. Wolf*, *A. Ritchey*. The board organized by electing the following officers: President, *H. J. Higgins*, *Higginsville*, Mo.; Vice-President, *J. Starkey*, *Holden*, Mo.; Secretary, *F. B. Hayes*, *Holden*, Mo.; Treasurer, *John G. Capetress*, *Ft. Scott*, Kansas.

Illinois Central.—*Mr. Tomas Dorwin* has been appointed Northwestern Passenger Agent, in place of *M. Barron*, transferred to ticket office at *Central Depot*, *Chicago*.

Indiana, Bloomington & Western.—*Mr. Charles Thompson* has been appointed Superintendent of Rolling Stock, in place of *J. L. Cooper*, resigned.

Mr. D. H. Sherman has been appointed Engineer and Road-Master, in place of *George E. Howe*, resigned.

Jeffersonville, Madison & Indianapolis.—*Mr. H. B. Dering* has been appointed General Passenger and Ticket Agent, with office in *Louisville*, Ky., in place of *A. Anderson*, resigned. The statement (taken from an Indianapolis paper) that *Mr. I. Baldwin* had been appointed to the position, was not correct.

Louisville & Nashville.—The following circular from General Manager *F. de Funiak* is dated Oct. 28:

"Mr. Reuben Wells is hereby appointed Superintendent of Machinery of this line. Appointment to take effect Nov. 1, proximo."

Mr. Wells has been Master Mechanic of the *Jeffersonville, Madison & Indianapolis* road for 26 years. He is well known to our readers as Vice-President of the Master Mechanics' Association, and author of several very valuable reports on boiler construction made to that association.

Louisville, Cincinnati & Lexington.—*Mr. J. H. Pearson* has been appointed Road-Master, in place of *R. Rogers*, resigned. *Mr. Pearson* has been in the service of the company some time, and was recently in charge of construction of the leased *Cumberland & Ohio* road.

Massachusetts Central.—At the annual meeting in *Boston* last week the following directors were chosen: *George S. Boutwell*, *Groton*, Mass.; *Thomas Talbot*, *Billerica*, Mass.; *Ginery Twichell*, *Brookline*, Mass.; *Oliver Ames*, *North Easton*, Mass.; *Francis Brigham*, *Hudson*, Mass.; *J. Edwin Smith*, *Worcester*, Mass.; *Lewis J. Dudley*, *Lake Lyman*, *Northampton*, Mass.; *Wm. A. Dickinson*, *Henry F. Hills*, *Amherst*, Mass.; *Franklin Bonney*, *Hadley*, Mass.; *Franklin Haven*, *J. G. Abbott*, *Amos W. Stetson*, *Silas Seymour*, *James W. Rollins*, *Boston*.

New York, Connecticut & Eastern.—The directors of this new company are: *Henry R. Parrott*, *Andrew L. Winton*, *Bridgeport*, Conn.; *George R. Cowles*, *Samuel E. Olmstead*, *Norwalk*, Conn.; *Wm. T. Minor*, *Stamford*, Conn.; *George L. Clarke*, *N. W. Douglas*, *Providence*; *R. L. Cornelius*, *V. Sidell*, *New York*.

Ohio & Mississippi Mutual Aid & Benefit Association.—At the annual meeting in *Vincennes*, Ind., Nov. 2, the following officers were chosen: *C. B. Cole*, President; *James M. Shears*, Vice-President; *Wm. Frye*, Secretary; *C. G. Cole*, Treasurer.

Owensboro & Nashville.—The officers of this company, as reorganized in the interest of the *Nashville, Chattanooga & St. Louis*, which now controls it, are: *E. W. Cole*, President; *T. S. Anderson*, Secretary and Treasurer; *E. Culverhouse*, Superintendent; *E. F. Falconet*, Engineer. Offices at *Owensboro*, Ky.

Pennsylvania.—*Mr. Wm. C. Ward* is appointed General Freight Agent of the *Philadelphia & Erie Division*, with office at *Williamsport*, Pa., in place of *D. C. Hough*, resigned.

Mr. Wm. J. Rose succeeds *Mr. Ward* as General Agent for the company's fast local freight service.

Philadelphia, Germantown & Norristown.—At the annual meeting in *Philadelphia*, Nov. 3, the following managers were chosen for three years: *John A. Brown*, Jr., *Richard Dale*, *Lewis Elkin*, *H. C. Hart*. The road is leased to the *Philadelphia & Reading*.

Providence & Worcester.—Superintendent *W. E. Chamberlain* issues the following circular:

"Mr. O. L. Smith having resigned the position of Master Car-Builder of this company, *Mr. Albert Griggs* will assume the duties of that office, on and after Oct. 23, 1879, in addition to those of Master-Mechanic. His title will be Superintendent of Locomotive and Car Department, with office at *Providence*, R. I. All business pertaining to these departments should be addressed as above. All employees in these departments will respect any orders given by him."

Quincy, Missouri & Pacific.—At a meeting held in *West Quincy*, Nov. 1, *Messrs. Solon Humphreys*, *A. L. Hopkins*, *George L. Dunlap*, *C. W. Ridgeley* and *Frank Ferris* were chosen directors, to fill vacancies made by resignations. The new directors are all connected with the *Wabash Company*.

St. Louis & San Francisco.—The following circular from the office of the Vice-President is dated Oct. 28:

"Mr. James Hanne having resigned the office of Auditor of this company, *Mr. A. Douglas* has been appointed Acting Auditor. All communications relating to that department should be addressed to him."

St. Louis, Keokuk & Northwestern.—*Mr. G. W. Newcomer* has been appointed Car Accountant, in place of *James C. McKee*. Office at *Keokuk*, Iowa.

Valley of Ohio.—The officers of this road are: *J. H. Wade*, President; *S. T. Everett*, Vice-President and Treasurer; *W. B. Porter*, Secretary; *S. C. Baldwin*, General Manager; *C. B. Childs*, Chief Engineer. Offices in *Cleveland*, Ohio.

Wabash.—The following circular, from the office of the General Superintendent and Chief Engineer, is dated Oct. 28:

"Mr. F. J. Hecker having resigned his position as Superintendent of the Eel River Railroad, to take effect Nov. 1, 1879, from and after that date the Eel River Division will be operated as a part of the Eastern Division of this railway."

"The following officers will assume charge of their respective departments on that division: K. H. Wade, Superintendent, Fort Wayne, Ind.; W. S. Lincoln, Resident Engineer, Toledo, O.; Wm. Wilson, Master Mechanic, Fort Wayne, Ind. Employés in the respective departments on the Eel River road will obey their orders and be governed accordingly."

Western Maryland.—The new board has reelected J. M. Hood, President and General Manager; Alexander Rieman, Vice-President; John S. Harden, Secretary and Treasurer.

York Springs & Dillsburg.—At the annual meeting held Oct. 21, A. K. Myers was chosen President, with the following directors: Jacob Grant, W. F. Bonner, A. B. Dill, Alerham Grove, L. W. Heikes, Jacob Leer, Abraham Trostle, Isaac B. Trostle, L. E. Wierman.

PERSONAL.

—Mr. F. S. Van Alstyne, General Southern Agent for the Pennsylvania Railroad and the Union Line, died in Columbus, O., Oct. 30, having been taken sick in that city a few days before, while on his way from New York to his home in Louisville. He was at one time connected with the Louisville & Nashville road, and was widely known.

—Mr. George E. Howe, Engineer and Road-Master, and Mr. N. L. Cooper, Superintendent of Rolling Stock of the Indiana, Bloomington & Western, have resigned their respective positions. Both have been on the road several years.

—Mr. N. M. Holmes, Superintendent of Bridges of the Chicago, Rock Island & Pacific road, was killed near Atchison, Kan., Oct. 26, the engine on which he was riding having jumped the track and upset, crushing him under it.

—Mr. James Hanna has resigned his position as Auditor of the St. Louis & San Francisco Company, his resignation taking effect Nov. 1.

—Mr. Charles Hewitt, President of the Trenton Iron Company, Vice-President of the New Jersey Steel and Iron Company, and for many years a prominent iron manufacturer, died at his residence in Trenton, N. J., Nov. 2. He was a brother of Hon. Abraham S. Hewitt, of New York.

—Mr. O. L. Smith has resigned his position as Master Carpenter of the Providence & Worcester Railroad.

—Mr. R. Rogers, for many years Road-Master of the Louisville, Cincinnati & Lexington, has resigned that position, and will go into the business of quarrying stone near Bedford, Indiana.

—Hon. Garrett A. Hobart, Receiver of the New Jersey Midland road, was on Tuesday reelected to the New Jersey State Senate from Passaic County. Mr. Hobart has served one term in the Senate and several in the Assembly, where he was chosen Speaker two years. His present reelection is emphatic tribute to his standing and popularity, for he ran ahead of his ticket and received the largest majority ever given to any candidate in the district.

—The new board of directors of the Massachusetts Central, is exceptionally strong in men prominent in Massachusetts politics. It includes George S. Boutwell, ex-Governor, Congressman, Senator, and Secretary of the Treasury; Thomas Talbot, now Governor of the State; Josiah G. Abbott, ex-Congressman, and last year candidate for Governor; Ginery Twichell, ex-Congressman; Luke Lyman, holder of some county offices, and long a political "boss" in western Massachusetts, and several others of local political note.

—Mr. Charles A. Moore, President and General Manager of the Consolidated Safety Valve Company, of Boston, was married at Norwalk, O., Sept. 30, to Miss Minnie Campbell of that place. The wedding was a very brilliant affair, at which a large number of guests were present.

—Mr. S. B. Burtch, Master Mechanic of the Burlington & Southwestern Railroad, died recently at his residence in Burlington, Ia. We are not informed of the exact date or of the cause of his death.

—Mr. D. C. Hough has resigned his position as General Freight Agent of the Philadelphia & Erie division of the Pennsylvania Railroad.

—On Oct. 30, the last day of Mr. Reuben Wells' service as Master Mechanic of the Jeffersonville, Madison & Indianapolis road, the employés of the Jeffersonville shops gathered in a body at his office, where Mr. Howard Thomas, foreman of the paint shop, as spokesman, bade farewell to Mr. Wells in an address expressing the highest esteem and regard. Mr. Wells responded in appropriate terms, and the following resolutions, prepared by a committee, were presented to him:

"Whereas, It has been made known to us that Mr. Reuben Wells is about to sever his connection with the Jeffersonville, Madison & Indianapolis Railroad, of which he has for the past 26 years been the Master Mechanic, and that the termination of his long services in this position is for the purpose of entering upon another field of duty; therefore be it

"Resolved, That this announcement has filled us with deep regret, for the reason that it terminates a long and intimate personal and business association, which had become all the more prized on account of its duration; but it is gratifying to find that the ties of friendship cemented thereby cannot be dissolved, that it is our privilege to bear testimony, as we now do, that our intercourse with Mr. Wells has always impressed us with his signal ability as a thoroughly practical railway mechanic, and as possessing in an eminent degree that sterling integrity of character and uniform courtesy and kindness of demeanor which will ever insure for him a cherished place in our hearts.

"Our best wishes for his health, happiness and prosperity will go with him to his new field of usefulness, well knowing, as we do, that his well-won reputation will precede him; that in his new relations his services will prove to be an acquisition not easily overvalued."

TRAFFIC AND EARNINGS.

Chicago Shipments East.

During the period that the tariff of Aug. 25 was in force, that is, the seven weeks ending Oct. 12, rates being 30 cents on grain and 35 on fourth-class from Chicago to New York, the shipments by the several roads were, in tons:

	Tons.	P. c. of total.
Michigan Central	60,779.09	27.5
Lake Shore & Michigan Southern	55,864.83	25.3
Pittsburgh, Fort Wayne & Chicago	55,398.26	25.1
Pittsburgh, Cincinnati & St. Louis	21,354.39	9.7
Baltimore & Ohio	27,263.32	12.4
Total	220,630.80	100.0

Railroad Earnings.

Earnings for various periods are reported as follows:

Ten months ending Oct. 31:

	1879.	1878.	Inc. or Dec.	P. c.
St. Louis & San Francisco	\$1,241,054	\$987,270	I. \$253,784	25.7
St. Louis, iron Mt. & So	3,965,115	3,510,715	I. 454,400	12.9

Nine months ending Sept. 30:

	1879.	1878.	Inc. or Dec.	P. c.
At. Miss. & Ohio	\$1,166,007	\$1,108,143	D. \$52,136	2.7
Dakota Southern	147,205	156,893	D. 9,691	6.2
Southern Minnesota	421,771	490,875	D. 69,104	14.1

Eight months ending Aug. 31:

	1879.	1878.	Inc. or Dec.	P. c.
Alabama Great South	\$254,907	\$220,707	I. \$34,200	15.5
Net earnings	34,956	52,157	D. 17,201	33.0

Three months ending Sept. 30:

	1879.	1878.	Inc. or Dec.	P. c.
Louisville, Cincinnati & Lexington	\$305,585	\$275,556	I. \$30,029	10.9
Net earnings	130,753	103,429	I. 27,324	26.4

Two months ending Sept. 30:

	1879.	1878.	Inc. or Dec.	P. c.
Great Western	\$671,000	\$670,000	I. \$1,000	0.1
Net earnings	221,000	209,100	I. 12,800	6.1

Month of August:

	1879.	1878.	Inc. or Dec.	P. c.
Alabama Great South	\$34,807	\$31,850	I. \$2,957	9.3
Delaware & Hudson Canal Co., leased lines	457,732	428,167	I. 29,565	7.0

Net earnings

	1879.	1878.	Inc. or Dec.	P. c.
At. Miss. & Ohio	\$177,342	\$153,880	I. \$23,462	15.2
At. & Great Western	429,285	340,149	I. 89,136	26.2

Dakota Southern

	1879.	1878.	Inc. or Dec.	P. c.
Louisville, Cincinnati & Lexington	15,560	17,431	D. 1,865	10.7
Net earnings	105,765	86,971	I. 18,794	21.6

Net earnings

	1879.	1878.	Inc. or Dec.	P. c.
New York & New England	47,018	34,018	I. 12,400	36.0
Net earnings	210,421	89,180	I. 127,241	142.7

Month of October:

	1879.	1878.	Inc. or Dec.	P. c.
St. Louis & San Francisco	\$213,680	\$123,852	I. \$80,828	72.5
St. Louis, iron Mt. & So	713,260	583,893	I. 129,217	22.1

Union Pacific

	1879.	1878.	Inc. or Dec.	P. c.
Third week in October:	1,543,580	1,269,805	I. 273,775	21.6

Atchison, Topeka & Santa Fe

	1879.	1878.	Inc. or Dec.	P. c.
Chicago & Alton	161,605	110,456	I. 45,149	38.7
Minneapolis & St. Louis	12,910	8,172	I. 4,744	58.0

Mo., Kansas & Texas

	1879.	1878.	Inc. or Dec.	P. c.
107,905,000	101,142,000	6,853,000	I. 6,853,000	6.8

Week ending Oct. 25:

	1879.	1878.	Inc. or Dec.	P. c.
Grand Trunk	\$230,230	\$188,629	I. \$31,601	16.8

Chicago Lumber Traffic.

Receipts and shipments of lumber and shingles for the ten months from Jan. 1 to Oct. 28, have been as follows:

Receipts: 1879. 1878. Increase. P. c.

	1879.	1878.	Increase.	P. c.
Lumber, ft.	1,260,845,293	977,267,042	292,577,651	30.0
Shingles, No.	575,021,000	552,807,000	22,814,000	4.1

Shipments:

ful, all the companies uniting in a considerable increase. It is understood that a further increase will be made next month.

Coal shipments from Pictou, Nova Scotia, for the ten months ending Oct. 28 were: 1879, 185,672; 1878, 194,089; increase, 61,583 tons, or 49.6 per cent.

Cincinnati coal receipts for the year ending Sept. 30 are reported as follows, in bushels:

	1878-79.	1877-78.	Inc. or Dec.	P. c.
Pittsburgh	20,760,027	20,743,155	D. 5,974,028	21.5
Ohio River	4,068,254	3,288,008	L. 780,444	23.7
Kanawha	6,134,090	6,286,623	D. 252,584	39.5
Muskingum Valley	85,500	118,580	D. 33,083	26.1
Hocking Valley	800,000	1,039,775	D. 239,775	13.1
Cannel	333,549	380,768	D. 47,219	12.5
Anthracite	768,750	439,350	L. 329,400	74.9
Scattering	1,251,350	496,067	L. 755,283	15.2
Total	34,210,667	38,802,220	D. 4,682,563	12.0

Scattering receipts are chiefly Ohio coal by rail. The bushel is from 76 to 80 lbs., so that the total receipts were in tons, 1,868,427 last year, and 1,555,689 tons the preceding year.

Boston Ice Freights.

The railroads running into Boston have agreed to reduce the rates on ice hauled into that city for shipment by sea. This action was made necessary by a diversion of part of the very considerable export trade in ice from Boston to Maine, where a good deal of ice is now cut on the rivers and stored at points where it can be loaded directly on vessels without any intermediate railroad haul.

Oil Transportation.

A dispatch from Bradford, Pa., Nov. 5, says: "It is stated here, on the best authority, that the New York Central and Lake Shore railroads, have refused, since Nov. 1, to carry oil for the Standard Oil Company at the ruinously low rates contracted for in June last, when the Tidewater Pipe Line was opened. With the expectation of freezing out the Tidewater Company, the freight from the Bradford oil-field to New York was fixed at 20 cents per barrel, 5 of which was allowed to the United Pipe Lines for pipeage. The Tidewater Line has shown no signs of giving up, and that fact, in connection with the disclosures before the Hepburn investigating committee, decided the railroads to terminate the contract with the Standard. All oil loaded by Standard and Bostwick since Oct. 31 has been placed on side tracks. The refusal of the Lake Shore to continue the contracts forced the Standard Company to undertake the construction of a five-inch pipe line from the lower oil-field of Butler County to Cleveland, the contract for which was let last Wednesday."

RAILROAD LAW.

Passengers' Baggage.

A dispatch from Washington, Nov. 3, says: "In the Supreme Court to day Judge Harlan delivered the opinion of the Court in the case of the New York Central & Hudson River Railroad Company versus the Countess Olga de Maluta Tivaloff. The case came up on a writ of error from a judgment in the Circuit Court of New York against the railroad company in an action to recover the value of certain laces alleged to have been taken from the Countess's trunks while she was a passenger over the company's road. The countess is a Russian noblewoman and was traveling for pleasure. Her laces were valued at \$75,000. Justice Harlan said it was argued by counsel for the railroad company that the failure of the Countess to inform the company's agents when she gave them her trunks of their value and of the extraordinary nature of their contents was in itself an act of bad faith and a fraud upon the carrier which should prevent any recovery in this action. In the opinion of the Court it was undoubtedly competent for a carrier of passengers, by specific regulations distinctly brought to the knowledge of the passengers, to protect itself against liability as an insurer for baggage exceeding a fixed amount in value, except upon the payment of additional compensation proportioned to the risk; and in order that such regulations may be made practically effective the carrier may rightly require information from the passenger as to the value of the baggage. If the value thus disclosed exceed that which the passenger could reasonably ask to have transported without extra compensation, the carrier may make such additional charge as the risk justifies. It is also undoubtedly true that the carrier may be discharged from all responsibility as insurer, if the passenger, by any device or artifice, puts off inquiry as to the value of his baggage and thereby imposes upon the carrier responsibility beyond that which he was bound to assume. In the absence, however, of legislation limiting the responsibility of carriers for the baggage of passengers, in the absence of reasonable regulations upon the subject by the carrier of which the passenger has knowledge, and in the absence of all inquiry of the passenger as to the value of the articles carried, the Court cannot, as a mere matter of law, declare, as it was in effect requested in this case to do, that the failure of the passenger to disclose the value of his baggage is in itself a fraud upon the carrier which defeats any right of recovery. It is safe to say that by general law, in the absence of special regulations by the carrier, a passenger has the right to carry without extra compensation such articles adapted to his personal use as his necessities, comfort, convenience or gratification may suggest. To the extent that such articles exceed in quantity and value such as are ordinarily carried by passengers of like station, to that extent they are not baggage for which the carrier, by general law, is responsible as insurer. This Court holds, in view of the whole scope and bearing of the charge of the Court below, that no error was committed to the prejudice of the company or of which it can complain. The judgment of the lower court was therefore affirmed."

Justices Field, Miller and Strong dissented from Justice Harlan's opinion, on the ground that 275 yards of lace, claimed by the owner to be worth \$75,000 and found by the jury to be of the value of \$10,000, cannot as a matter of law be properly considered as baggage of a passenger for which the railroad company, in the absence of any special agreement, should be held liable. Mr. Justice Field delivered the dissenting opinion."

THE SCRAP HEAP.

Railroad Equipment Notes.

The Wakefield Rattan Co., of Boston, has just received an order for the seats for 50 new cars now building for the New York Elevated road.

Josiah M. Clark, at Howell, Mich., is filling an order for hand cars for the Cleveland, Painesville & Ashtabula road. He has also several orders for warehouse and platform trucks from different parties in Buffalo, Detroit, Milwaukee and other places.

The Harrisburg (Pa.) Car Works have just taken an order to build 500 box cars for the New York Central & Hudson River road.

The Brooks Locomotive Works, at Dunkirk, N. Y., have an order for five mogul freight engines, with 17-by-24-in. cylinders, for the Cleveland, Columbus, Cincinnati & In-

dianapolis road. They are also building several engines for the Columbus & Sunday Creek Valley road.

The salesroom of the Boston Car-Spring Co. has been removed to No. 60 Federal street, Boston. The company's factory is in Terrace street, Boston Highlands.

The Eames Patent Brake Co., at Watertown, N. Y., in one day recently received orders for 179 of their brakes, the largest orders ever taken in one day.

The Baldwin Locomotive Works, in Philadelphia, lately shipped five heavy narrow-gauge engines to the Denver & Rio Grande. They have just received from the Philadelphia & Reading Company orders for 16 consolidation and four ten-wheel freight engines, all to have the Wootton fire-box for burning coal dust.

The New York, New Haven & Hartford shops at Springfield, Mass., are building a new locomotive with 17-by-22 in. cylinders and 5-ft. 3-in. drivers. The steam ports are 16 by 1 1/2 in.; the valves have 1/2 in. outside lap and 3-16 in. inside lap, and the throw of the eccentric is 5 in. The boiler has 170 flues 2 in. diameter and 11 ft. 7 in. long; the outside shell is of best Bay State flange iron, and the fire-box of steel.

The Missouri Car & Foundry Co. is building 250 coal cars, to carry 15 tons each, for the Columbus & Hocking Valley road.

A shipment of passenger cars by the Wason Manufacturing Company, noted last week, was to the Lake Erie & Western, not to the New York, Lake Erie & Western, as then stated.

Iron and Manufacturing Notes.

The Iron Age's quarterly statement of the condition of the blast furnaces of the United States on Oct. 1 is as follows:

	In blast.	Out of blast.	Not reported.	Total.
Charcoal	97	159	3	259
Bituminous or coke	112	90	202	304
Anthracite	128	98	4	230
Total	337	347	7	691
Total weekly capacity	71,300	49,410	...	...

As usual, the figures indicate that it is the older and smaller furnaces which are out of blast.

Worley Furnace, in Dickson County, Tenn., has been leased to J. C. & Leslie Warner, who will repair it and start it up as soon as possible.

The Indianapolis Rolling Mill is making light iron rails for the Dayton & Southeastern road.

The rolling mill at Chickies, Pa., is running full double turn.

The Pembroke Iron Co. is running its rolling mill at Pembroke, Me., single turn.

The Pittsburgh Bolt Works have been sold and a new company will be organized by the purchasers.

Arrangements are being made by the bondholders of the old Superior Iron Co., to form a new company to operate the works of that company, which are now idle, except the rail mill which is leased to A. Kloman. The Manchester Iron & Steel Co. is to be the name of the new concern.

The Shenango Iron Works, at New Castle, Pa., have been leased to parties who will start up both the furnaces and the rolling mill.

The rolling mill and furnace at Warren, O., have been leased to parties from Youngstown, who are preparing to start up both of them.

The Warren Foundry, in Phillipsburg, N. J., is running full time with a large force, and many orders on hand.

Oxford Furnace, in Warren County, N. J., is in blast.

Nearly all the iron mines in Northern New Jersey are at work.

Bridge Notes.

The Detroit Bridge & Iron Works have the following bridge orders on hand: Eight spans 140 ft. each, for the Vermont Central Railroad, at Waterbury, Vt.; for a single track iron bridge 250 ft. in length over the Jacques Cartier River, near Quebec, for the Quebec & Lake St. John Railroad; for 500 tons of bridges for the Great Western Railway of Canada, and have received orders to go ahead and deliver 15,000 tons of fabricated iron for the Second avenue extension of the New York Elevated Railroad, between Sixty-ninth street and Harlem.

Clark, Reeves & Co., at Phenixville, Pa., have contracted for an iron bridge of three spans 140 ft. each, for the Vermont Central Railroad, at Waterbury, Vt.; for a single track iron bridge 250 ft. in length over the Jacques Cartier River, near Quebec, for the Quebec & Lake St. John Railroad; for 500 tons of bridges for the Great Western Railway of Canada, and have received orders to go ahead and deliver 15,000 tons of fabricated iron for the Second avenue extension of the New York Elevated Railroad, between Sixty-ninth street and Harlem.

Steel rails are firm at \$54 to \$56 per ton at mills, with more orders offering than the mills can take.

Iron rails are more active, with increasing inquiry. Quotations are \$49 to \$52 per ton at mill, with the mills generally full of orders. A purchase of a considerable lot of foreign rails is reported at a price amounting to \$47.80 per ton delivered at Pensacola, Fla., on cars on the wharf.

Old iron rails are quoted at \$31 to \$32, with a good many now offered, and the market dull.

Train Accident Report—A Correction.

A correspondent informs us that an account given in the September train-accident report of a collision on the Boston & Albany near Washington, Mass., was incorrect. The train broke into three parts as described, and was stopped much as described, but the pusher had left it and it was going down the grade at the time. The engineer used the steam so as finally to stop the train and mitigate the damage as much as possible, as was stated in our report, but it was the engineer of the train engine and not of a pusher. Our correspondent adds that the company presented the engineer and one of the brakemen with an extra month's pay as a reward for their coolness and good judgment.

Fire-Breaks.

Railroads have unexpected uses sometimes. The other day a town in Minnesota was saved from destruction by a prairie fire by the road-bed of the Southern Minnesota, just graded past the town, which served as a fire-break.

They have powerful brakemen on the Reading road. One of them was fined two days' pay this week "for knocking a car off the track and running it into the station-house."—North American.

And now our exchanges are beginning to tell big stories about long trains again. They have got up to 103 cars and two engines at latest accounts, but it will be 130 cars and three engines at least before another week.

Some suburban commuters think their tickets entitle them to take three parcels, basket, a valise and a big dog into the passenger car, and the bare mention of extra baggage sets them off worse than a red rag does a mad bull.

The Plague of Railroads.

The story seems to be the same the world over: the railroad is lauded to the skies until it is built, and then it is abused forever after. A leading German journal, the *National Zeitung*, says, in an article on the fiftieth anniversary

of the Rainhill trial: "There can be no doubt that infinitely more paper and ink have been expended in complaining of the railroads than in celebrating them. Let one run through the reports of the chambers of commerce and other associations. Complaints, nothing but complaints! Bitter complaints of too high rates, of slowness, of irregularity in transportation, of injury on account of competitive struggles. He who should obtain his knowledge of our progress chiefly from this literature, would inevitably arrive at the conclusion that in Germany and generally throughout the inhabited world up to the year 1829 the art of transporting freight cheaply, quickly, and safely to general satisfaction, had been preserved, but that after that time this art had been lost, and the previously existing excellent transportation enterprises had been succeeded by a wretched makeshift, the railroads.

"Sums have been invested in railroads which, if they had been named 50 years ago, would have made one giddy. And yet there is a constant demand for the extension of the existing system. Not yet has the art died out of making up estimates of profits for railroads that are to be built in which it is clearly shown that a railroad on a certain route, in case it is built, will transform the adjoining country into a paradise. And as soon as the railroad is in operation, in place of these excessive hopes comes the complaint that all well founded wishes have been deceived.

"When a railroad is newly opened, there are few who rejoice in that future they can make in four hours the journey that hitherto has cost them twelve hours of time; on the contrary there is growling at the slow train, and a demand for an express train which will make the trip in two hours. The landowner who is enabled to load his grain within two-hundred paces of his barn for the nearest market town, no longer remembers how high his transportation expenses used to be ten years ago, when he had to haul it some twenty miles with his own horses, but he spies around anxiously to see if there is anywhere else a railroad whose rates are lower. Just as soon as the usual toast has been answered at the festival over the newly opened railroad, one may depend upon it that the last word of friendship and good will has fallen that it can count upon during its existence."

A Strange Passenger.

One morning this week, when an eastward-bound freight on the Erie came up to the depot at this place, running fast ahead of No. 8, a large white-faced heifer stood right up on the pilot of the engine. As the train halted she rolled off on one side, when it was found that two of her legs were broken. The cow-catcher of the locomotive had caught the heifer up at the crossing above, and brought her in as described. It was necessary to kill the poor creature to put her out of her misery.—*Olean (N. Y.) Times*.

Attempt at Train-Wrecking.

On last Saturday night the up passenger train for Shamokin met with an accident which might have ended disastrously had the train been running at a higher rate of speed. A short distance above the Patterson station is a siding known as the Big Creek siding. Some malicious person, either through pure devilry or else for the purpose of revenge, had imbedded a coupling-pin in the frog at this station, doubtless with the intention of throwing the train from the track. After striking the casting the train was promptly brought to a standstill and the obstruction removed. The only damage the engine sustained was the breaking of the flange. Lieut. Moyer, of the Coal and Iron police, has the case in hand and is working it up.—*Pottsville (Pa.) Miners' Journal*, Oct. 28.

Duty on Old Iron Rails.

The Baltimore & Ohio Railroad Company recently appealed to the Secretary of the Treasury from an assessment of duty levied by the Collector of Customs at Baltimore, at the rate of 70 cents per hundred pounds, on certain old iron rails imported per steamship *Germany*. The appellants claimed that the rails in question were fit only for remanufacture, and should be classified as wrought scrap iron, at a duty of \$8 per ton.

After a general review of the subject, Assistant Secretary French, in his opinion, says: "This department has to state that the general fitness for use, other than the remanufacture, of old rails imported into the United States, is not to be determined by the mere possibility of such use, because it no doubt would be possible, by adapting new fish-plates, to use, without remanufacture, very many of the old rails imported in good faith for rerolling purposes. The general character of the importation should be considered, rather than the exceptional condition of a small part of it, where, as a whole, the rails are only fit for remanufacture. Where there is evidence of a fraudulent intention to pass as scrap iron rails suitable for other uses than remanufacture, with intent to use them as rails without rerolling, it is the duty of the customs officers to seize them for forfeiture."

"Old rails, of a character which are not generally used in the United States, as double-headed rails, and which, by their special character, are generally unfit for purposes in this country other than rerolling, may properly be classified as old scrap iron.

"The classification of invoices of old iron rails may be determined generally by the obvious uses for which they are intended, and they should be admitted at a duty of \$8 per ton, unless there are reasons for believing that they are to be sold and used in the condition as imported without being rerolled.

"Upon a perusal of the report of the Appraiser in the present case, and considering the character and condition of the rails in controversy, it is evident that a strict application of the terms of decision No. 4,129 (under which the duties in this case were assessed) might justify the classification of such rails at the rate of duty imposed upon new rails, but the Department is of opinion that a broader view may be safely adopted in determining generally the classification of these rails for duty. The report of the Appraiser further shows that, under the views above expressed, the rails involved in this appeal are of a character which may properly be regarded as old scrap iron, fit only for remanufacture."

"The Collector of Customs has therefore been authorized to readjust the entry at the duty of \$8 per ton, and forward a certified statement for refund of excess of duty exacted."

OLD AND NEW ROADS.

Atchison, Minneapolis & Saline Valley.—This company has filed articles of incorporation in Kansas to build a railroad from Clyde southwest to Minneapolis, and thence westward to the Colorado line. The corporators are all connected with the Central Branch, Union Pacific.

Atchison, Topeka & Santa Fe and the Denver & Rio Grande.—The Commission appointed by the United States Circuit Court to investigate the matter of the road through the Grand Cañon west of Cañon City has made a report, the conclusions of which are summed up as follows:

"Your commission, therefore, answers the interrogatories submitted, as follows, viz.:

"In constructing two roads from Cañon City to the twentieth mile post, they must occupy the same track, according to the first plan, herewith presented, from the entrance to

the Grand Cañon at station 185 of the constructed line to the head of the cañon at station 591. According to plan second, herewith presented, they need not occupy the same track at any point.

According to plan three, herewith presented, they must occupy the same track from station 341x70 to station 557x50, a distance of about 4.09 miles, unless the road between these points is double tracked, in which case the two roads need not occupy the same track at any point.

The Grand Cañon of the Arkansas River is not broad enough to enable both companies to proceed without interference with each other in the construction of their respective roads. One railroad is already constructed through the Grand Cañon of the Arkansas River, and this road will interfere with and render impracticable the construction of a second road, except as described and set forth in the several plans herewith presented. In the narrow portion of the cañon, from station 341x70 to station 557x50, it is impracticable to construct a second line, except by double tracking. A railroad has already been built through this portion of the cañon, the cost of which is shown by the statement of the Chief Engineer, A. A. Robinson.

The Cañon City & San Juan Railroad Company, or the Pueblo & Arkansas Valley Railroad Company, have constructed a railroad complete from Cañon City to the twentieth mile post. The line so constructed is on the north bank of the Arkansas River, and, in general, follows its winding. From Cañon City to station 185 the line is below the Grand Cañon of the Arkansas River, and on this part of the line there is space for another line to be constructed at about the same cost as that of the road which has already been built.

For constructing two roads from the twentieth mile post to Leadville it is not necessary that they should occupy any portion of the track in common.

The cañons on said roads are broad enough to enable both companies to proceed without interference with each other in the construction of their respective roads, except that the second line must occupy the same right of way at many points with the one already constructed, and the line of the latter road will have to be moved slightly at points where the space between rocky points and the river is not sufficient for the two tracks without such change in the alignment as to permit the construction of the second road without excessive cost, unless the line of the first road is so changed.

One road has been partially constructed through all the cañons of the Arkansas River between the twentieth mile post and Leadville, and this road will only interfere with the construction of a second line as above stated. In the narrow portions of said cañons there are no places where the construction of a second line is impracticable.

If the two roads shall be built on the same route from the twentieth mile post to Leadville, the commissioners are of the opinion that for the most part the natural choice of ground for the second road would be on the opposite side of the river from the present constructed line. Yet, at places it is apparent that by rigid adherence to this plan, the line would be unduly lengthened by following the windings of the river. Notably this would be the case between Cleora and the lower end of Brown's Cañon.

It would seem expedient, therefore, that the company building a second road should be able to select the most available ground for its line on either side of the river, when this may be done without unnecessary interference, or encroachment upon the right of way of the present constructed line."

Baltimore & Hanover.—The track of this road is now laid to the junction with the Western Maryland at Emory Grove, Md., 20 miles southward from the starting point at Black Rock on the Bachman Valley road. The ballasting and other work have been kept well up with the track, and the road will probably be ready for business by Nov. 15. It has been built in the interest of the Hanover Junction, Hanover & Gettysburg Company, and is designed to give the system of short lines controlled by that company a shorter and more direct connection with Baltimore than the old one over the Northern Central. It also passes through an excellent farming country, where it can secure some local business. The road is expected to bring considerable traffic to the Western Maryland, and also to take some trade to Baltimore which now goes to Philadelphia or Harrisburg.

Bellair & Southwestern.—Trains on this road now run to Jerusalem, O., 4½ miles beyond the late terminus at Beallsville, and 26 miles from Bellair. There still remain 8½ miles of track to be laid to reach Woodsfield, which is to be the terminus.

Bellair & Eldorado.—This road is now completed to Duquoin, Ill., 18 miles westward from the late terminus at Benton. This makes the road 50 miles long, from Eldorado on the Shawneetown Branch of the St. Louis & Southeastern to Duquoin. It is understood that the road will be worked by the St. Louis, Alton & Terre Haute Company, with whose "Cairo Short Line" it connects at Duquoin. That company will have a line from East St. Louis to Eldorado, 121 miles long.

Boston & Albany.—This company is making rapid progress with the work in connection with the proposed new Kneeland-street station at Boston. About half of the new freight house, extending from Harvard to Oak street, is ready for the roof, and preparations are being made for another freight house to extend from Howard to Kneeland street. When these are finished the present large freight house will be transformed into a first-class passenger station.

The train-men on this road are now being subjected to an examination as to the soundness of their sight. Several tests are applied, some to detect color-blindness, if it exists, and others to show whether the sight is sound and good. Of those who fail to pass the color test, it is said that most mistake red for black.

Burlington & Missouri River in Nebraska.—A contract has been let to John Fitzgerald, of Lincoln, Neb., for grading an extension of the Republican Valley Branch from Naponee, in Franklin County, Neb., westward 100 miles through Harlan, Furness, Red Willow and Hitchcock counties.

Champaign, Havana & Western.—This company is at work on the bridge over the Illinois River, at Havana, and has contracted for ties and other material for the extension of its road westward from that place.

Chicago & Eastern Illinois.—At the recent annual meeting the stockholders voted to ratify a lease of the Chicago & Western Indiana road, which, when completed, is to extend from Dolton, the northern terminus of the road owned by this company, northward into Chicago, some 20 miles.

Chicago, Milwaukee & St. Paul.—The La Crosse (Wis.) Republican says: "The large 24-stall round-house on the North Side has just been completed, and is now the largest on the line of road, except those at the terminus, and the immense work, which has occupied the entire summer, in filling in the pile-work portion of the bridge across the Mississippi, is almost finished, and the river is crossed upon a solid track, except that portion actually span-

ning water. Two pieces of work of considerable magnitude are still in progress, the building of large stone piers in Black River to protect the Black River draw-bridge from the ice, and the construction of a Y track on the west side of the round-house. Now and in years past trains coming from St. Paul to La Crosse were obliged to run east through the North Side and then back down into the city a distance of over a mile. The track now being built extends from the draw-bridge over Black River south until it joins the old track, thus saving at least half a mile of distance. The track was first built of pile work, which is now being filled in. The track is a substantial one, and, like the rest of the work done here in the past year by the St. Paul road, shows that the company's interests here are nothing temporary, and that they have fully made up their mind to make La Crosse an important point on the road."

Chicago, Pekin & Southwestern.—The United States Circuit Court has granted the petition for the removal of the foreclosure suits against this company from the State court, and ordered that the case be placed on the docket.

Chicago & Western Indiana.—In the matter of the application for an injunction to restrain this company from building its road through certain streets in Chicago, the Court decides that the company has sufficient authority to build under the ordinance of the City Council. The company's demurrer is sustained, and the bill for an injunction dismissed. The applicants for the injunction took an appeal.

In the matter of the application to enjoin the company from building through Wallace Parkway in the town of Lake, the company's demurrer was overruled and an indemnity bond required for damages that might be incurred.

Cincinnati & New Richmond.—This company has filed articles of incorporation to build a narrow-gauge railroad from Cincinnati up the Ohio River to New Richmond, in Clermont County, about 20 miles.

Cincinnati Southern.—The Cincinnati Railway Company, lessee, reports the earnings of the completed section from Cincinnati to Somerset, Ky., 158 miles, as follows, for the quarter ending Sept. 30:

	1879.	1878.	Inc. or Dec.	P. c.
Gross earnings...	\$183,470.51	\$150,506.86	1. \$23,909.65	15.0
Expenses.....	40,985.61	44,890.01	1. 5 086.00	11.3

Net earnings... \$133,490.90 \$114,667.25 1. \$18,823.65 16.4

Int. on capital...	7,059.25	6,548.61	1. 510.64	7.8
--------------------	----------	----------	-----------	-----

Balance due Trustees..... \$126,431.65 \$108,118.04 1. \$18,313.01 16.0

The company now has on the road 19 engines; 11 passenger and 7 baggage and mail cars: 175 box, 150 stock, 100 coal, 155 flat and 9 cabooses cars. Of the lessee company's subscribed capital 45 per cent., or \$450,000, has been called in, of which all but \$262.50 has been paid up. The working expenses for the quarter were only 27.24 per cent., against 28.13 per cent. last year.

Delaware Western.—Large purchases of the stock of this road have recently been made in Wilmington, Del., by parties said to be buying for the Pennsylvania Railroad Company. The report is that that company wishes to secure a branch line to Wilmington, and to establish coal docks there. Col. H. S. McComb, of Wilmington, has also been buying largely of the stock, and is said to want a controlling interest, with what object is not known. The stock represents the entire property of the company, the bonded debt having been wiped out by foreclosure.

Denver Pacific.—A proposition from Jay Gould to buy the stock in this road held by Gilpin County, Col., \$1,000,000 in amount, for \$100,000, is to be submitted to popular vote.

Denver, South Park & Pacific.—The Commissioners of Gilpin County, Col., have decided to submit to popular vote a proposition from Jay Gould and others to buy for \$150,000 the \$300,000 stock in this road now held by the County.

Denver Union Depot.—This company has been organized with \$300,000 capital stock to build a Union depot in Denver, Col., to accommodate all the roads entering the city.

Detroit, Lansing & Northern.—At a special meeting held in Detroit last week the articles of incorporation of the company were so amended as to cover the extension of the Stanton Branch northward to Big Rapids, Mich., 25 miles beyond its present terminus at Blanchard. Work on this extension is now in progress.

Flint & Pere Marquette.—The Court has authorized the Receiver to build a branch or spur three miles long, in Mason County, Mich., chiefly to carry lumber.

The Court has also authorized the Receiver to pay interest on the Flint & Holly bonds.

The road reports a very heavy business thus far this year. The lumber business is active, and its extent just now is only limited by the number of cars that can be supplied.

Grand Rapids & Indiana.—It is reported that this company and the Michigan Central are making arrangements to join together in building the extension of this road to the Straits of Mackinac. The plan is for the two roads to meet at Burt Lake and then build northward from that point together, each to own half the track and to be entitled to the use of the road.

Grand Trunk.—A dispatch from London, England, Oct. 30, says: "The Grand Trunk half-yearly meeting was held here to-day. The President, Sir Henry Tyler, said he thought the brightest prospect was dawnning. The acquisition of the line from Port Huron to Chicago was the most important event in the company's history. It would open the best route to Manitoba. Up to the present time about \$1,550,000 has been spent in gaining admission to Chicago; \$1,000,000 more would be required in the next six months, and \$2,500,000 in the next three years. But the securities would be readily taken in America, if the English shareholders did not choose to take them. He characterized the statement in a recent report of the Great Western Company, that its policy had been peaceful, and that of the Grand Trunk Company aggressive, as most untrue. He said: 'The Great Western Company has been a great bar to harmony in that part of the continent. We could never make arrangements with them, and we were prevented by them from making arrangements with other companies.'"

A line is being surveyed from St. Isidore, P. Q., on the Lachine & Province Line Division southwest to Dundee near the head of Lake St. Francis. It is on the south side of the St. Lawrence, and about 50 miles long.

Great Western Telegraph.—Mr. Thomas S. McClelland, of Chicago, Receiver of this company, writes to us as follows: "It may be of matter of some interest to you that as Receiver of the Great Western Telegraph Company, I am making efforts to restore the lines of that company from this city (Chicago) to Milwaukee, St. Louis, Omaha, Kansas City, Lincoln and other points in Illinois, Wisconsin, Iowa, Missouri, Nebraska and Kansas, to a practical working condition. These lines comprise over 2,000 miles. For some five years they have been under the control and management of the Western Union Telegraph Company, and have been al-

lowed to decay and go to destruction as fast as the elements and residents along the line could permit."

Gulf, Colorado & Santa Fe.—It is said that arrangements are being made by which the International & Great Northern trains will be run to Galveston over this road, coming upon it at Arcola, where it crosses the Columbia Division of the International.

Higginsville, Holden & Ft. Scott.—This company has been organized to build a railroad from Higginsville, Mo., on the Chicago & Alton's Kansas City Line, 55 miles east of Kansas City, southwest through Holden and Butler to Ft. Scott, Kan. The distance is about 110 miles, and the capital stock is fixed at \$870,000. The Chicago & Alton Company is expected to give substantial aid to the project.

Houston & Texas Central.—The grading on the extension of the Waco Branch westward is now completed for 48 miles westward from Waco, Tex., and the bridges over the Aquilla and the Brazos are well advanced. The road will run through Hamilton, Comanche and Erath, and into Eastland County. It passes through one section of rough and hilly country in crossing over from Steel's Creek to the Bosque Valley.

Indianapolis, Delphi & Chicago.—The grading of this road is now completed to a point about 18 miles from Indianapolis, and the company is negotiating for an entrance into that city over the Cleveland, Columbus, Cincinnati & Indianapolis tracks from Brightwood.

Kansas Pacific.—The Solomon Branch has been completed and opened for business to Beloit, Kan., 57.3 miles north by west from the junction with the main line at Solomon, and 228.5 miles from Kansas City. At Beloit it intersects the Central Branch, Union Pacific.

It is reported that the company has made a sale of a very large tract of land—300,000 acres is given as the extent—to some English capitalists who intend to cultivate it, making the land available by irrigation.

General Passenger Agent P. B. Groat, it is stated, is soon to go to England, to endeavor to work up the land interests of the company and induce immigration.

Louisiana Western.—The long stretch of piling in the Sabine River bottom is now all finished, except about 800 feet.

The track from Lake Charles, La., the central station, is now laid to Pine Island, 15 miles, and the work is advancing steadily.

Massachusetts Central.—At the annual meeting in Boston last week, it was reported that \$31,468 had been collected upon stock subscriptions. The bond account had been increased by \$351,000, of which \$200,000 had been pledged to secure a loan of \$33,200. Payments to the contractor amounted to \$179,274. Notes and accounts payable were reduced by \$10,934. It was voted to terminate all contracts for services, salaries, etc., on Oct. 31, leaving all contracts and appointments for the ensuing year to be made by the new board.

Minneapolis & St. Louis.—Track on the Ft. Dodge Extension is now laid to Lake Mills, Ia., 20 miles southwest from the old terminus at Albert Lea, Minn., and the rails are to be laid to Forest City, some 10 miles further, in a few weeks.

On the southern end of the road, the Ft. Dodge & Ft. Ridgely road, lately bought by this company, has been graded from the old terminus at Humboldt north 10 miles to Lott Creek, and track is to be laid this season.

Morgan's Louisiana & Texas.—This company having purchased (as heretofore noted), the Western Division of the New Orleans, Mobile & Texas road, will operate the line hereafter as the Donaldsonville Branch of its road. The line extends from Westwego, opposite New Orleans, west by north to Donaldsonville, 63 miles, running generally parallel to the Mississippi on the western side of the river.

Nashua & Lowell.—This company has been for some time considering the question of a Boston connection other than that over the Boston & Lowell, and it is now said that it will build a line from Lowell to connect with proposed Mystic Valley road, and use that road, entering Boston on the track of the Boston & Maine.

New Jersey & New York.—A plan of reorganization proposed for this company provides for the purchase of the road and the reorganization of a new company, which is to issue the following securities:

1. First-mortgage 6 per cent. bonds, \$400,000 in amount, to be used for the purchase of equipment now leased, the payment of certain claims covered by valuable collaterals and the purchase of six miles between Hackensack Junction and Hackensack, N. J., and seven miles between New Bridge, N. J., and the New York line, those sections now being owned by bondholders who have foreclosed prior mortgages.

2. Preferred stock, 6 per cent., \$800,000 in amount, to be exchanged for the \$583,000 Hackensack Extension bonds of 1870 and accrued interest. Preferred stock to have sole right of voting until six semi-annual dividends have been paid on it.

3. Common stock sufficient in amount to exchange for the consolidated gold bonds and accrued interest, and such unsecured claims as may be allowed by the committee. The Purchasing Committee to consist of L. Fitzgerald, Wm. S. Odyke and John J. McCook.

New London Northern.—Surveys are being made for an extension of this road from Turner's Falls, Mass., to Brattleboro, Vt. The line runs follows the valley of Fall River and passes through North Bernardstown. The object is to secure an independent line to Brattleboro, in case it is not found desirable to renew the present lease of the Vermont & Massachusetts branch line from Miller's Falls to Brattleboro. This leased section is 21.3 miles long, and the rental now paid is \$48,000 a year, to be increased after 1880 to \$54,000 a year. The lease does not expire until 1885, however, so that there does not seem to be any hurry about the new line.

New Orleans & Mobile.—On Oct. 24 the long pile bridge at Bay St. Louis, Miss., on this road caught fire and 1,600 feet of it was destroyed, none of the woodwork above water being left. Work on the rebuilding was begun at once, and, in spite of a storm which lasted 24 hours, it was completed so that trains passed over on the afternoon of Oct. 29. Five miles were kept running night and day to supply the lumber, of which 160,000 feet were needed. The work was under charge of Superintendent D. B. Robinson and Chief Engineer J. C. Ballantine.

New York & New England.—The \$1,250,000 first-mortgage bonds offered by this company have all been taken by two Boston banking houses—G. W. Ballou & Co., and Charles S. Swett & Co. The bonds are sold to provide money for the extension from Waterbury, Conn., to Brewster, N. Y.

The Connecticut Railroad Commission, having investigated complaints made of excessive use of locomotive whistles on this road, recommend that hereafter the bell alone be used instead of the whistle in the larger towns on the line—Hartford, New Britain and Waterbury—and that in other places

the signal when approaching a road-crossing be a single blast of the whistle, instead of four blasts as now used.

New York, Connecticut & Eastern.—This company has filed articles of incorporation in Connecticut for a railroad from New Haven westward to the New York line in Greenwich. The distance is 48 miles, and the capital stock is to be \$4,000,000. It is proposed to enter New Haven on the track of the New Haven & Derby road. The line chosen is parallel to and north of the New York, New Haven & Hartford, running far enough back from Long Island Sound to avoid bridging the streams where they are navigable, as no bridges over a navigable stream can be built without express permission from the Legislature.

New York, New Haven & Hartford.—A section of nine miles of this road, from New Haven, Conn., to Yalesville, is to be ballasted with broken stone. The work is now in progress.

Ohio & Mississippi.—In Chicago, Oct. 30, Judge Drummond, of the United States Circuit Court, began to hear arguments on a number of intervening petitions and claims in the foreclosure suits against this company. The principal matters to be disposed of are the application of Robert Garrett to be recognized as co-trustee under the second mortgage; the application of the Springfield Division bondholders for a separate receivership for that Division; the claims of the Cleveland Rolling Mill Company, the Joliet Iron & Steel Company and others to have their bills for supplies furnished made prior liens to the bondholders' claims, under the Ohio statute.

Old Colony.—The Fitchburg-Boston trains of this company's Northern Division now run over the Boston & Albany track between South Framingham and Boston, paying a rental for its use which the company considers rather heavy. It is therefore proposed to build a new track of its own from South Framingham or Sherborn east to connect with its own line outside of Boston. The connection could be made with 17 or 18 miles of new track and would run through the country south of the Boston & Albany, where some new suburban business might be built up.

Owensboro & Nashville.—This company, now controlled by the Nashville, Chattanooga & St. Louis, has submitted a proposition to the city of Evansville, Ind. The offer is to build a line from Owensboro to Evansville, with a steam-ferry transfer across the Ohio, the road to be finished within a year, provided the city will vote \$100,000 aid. The question will be submitted to a vote shortly.

Pennsylvania.—At the directors' meeting, last week, it was decided to declare a 2½ per cent. dividend for the last half-year. This will make 4½ per cent. on the stock this year, against two per cent. paid last year.

In Philadelphia, Nov. 4, argument was heard on an application made by an owner of property on the line, to enjoin the company from building the proposed new elevated road, from West Philadelphia into the city. The Court of Common Pleas heard the arguments and reserved its decision.

Pennsylvania Railroad in Maryland.—A Cumberland (Md.) letter of Oct. 31 says: "This morning in the Circuit Court Judges Alvey, Motter and Pearre, by a unanimous decision, set aside the award of the jury of condemnation in the case of the Pennsylvania Railroad in Maryland against the Baltimore & Ohio Railroad.

The Pennsylvania Railroad in Maryland desired to cross the track of the Baltimore & Ohio Railroad at the east end of the viaduct bridge in this city, and to connect with the coal track of the Baltimore & Ohio Railroad, so as to enable the Pennsylvania Company to reach the canal basin.

The jury allowed \$1,250 damages, but the Baltimore & Ohio Railroad claim \$100,000 for the right of crossing and connection. The court decided that the Pennsylvania Railroad in Maryland could cross the Baltimore & Ohio Railroad tracks on the bridge, but could not condemn land occupied by the Baltimore & Ohio Railroad, and that the damages were inadequate. It is probable that the Pennsylvania Railroad in Maryland will endeavor to purchase a strip of land back of St. Patrick's Church and parallel with the Baltimore & Ohio Railroad, and after running their track about 100 feet south of the bridge, effect the connection with the coal track without trespassing on the land of the Baltimore & Ohio Railroad.

Philadelphia & Atlantic City.—The Grand Jury of Camden County, N. J., has found indictments for manslaughter against J. S. Vertos, Assistant Superintendent; C. A. Redman, telegraph operator; John Ewing, conductor, and Ellwood Johnson, engineer of the freight train, the indictments being based on their share in causing the fatal collision at Clementon on Aug. 14 last. They will probably be tried at the present term of Court.

Pine Bluff, Searcy & Monroe.—This company is now negotiating with the St. Louis, Iron Mountain & Southern Company for aid, and is also trying to raise money in St. Louis. The projected line is from Pine Bluff, Ark., northward to Austin, on the Iron Mountain road, a distance of 60 miles, more than half of which is already graded.

Pioneer.—This company has been organized to build a narrow-gauge road from Deadwood, Dakota, in the Black Hills region, to the coal banks, about 45 miles distant. The capital stock is \$100,000.

Port Huron & Northwestern.—A contract has been let to John P. Sanborn to build an extension of 12 miles from Croswell, Mich., northward to Carsonville. Work is to be begun at once.

The company has executed a mortgage to secure an issue of \$700,000 bonds, to bear 7 per cent. interest; the proceeds to be used to complete and extend the road.

Portland & Ogdensburg, Vermont Division.—There is a report that negotiations are in progress for a lease of this road to the Connecticut & Passumpsic River Company. Such a lease could hardly be made while the road is in the hands of the Receivers.

Railroad Mail Service.—A Washington dispatch of Oct. 27 says: "The forthcoming report of the Superintendent of the Railway Mail Service will show that during the last fiscal year 59 lines of railway post-offices have been operated over 17,340 miles of railway, performing about 50,000 miles of daily service and nearly 18,000,000 miles of service annually. The aggregate number of miles of railroad mail service of all kinds, including the transportation not only of postal-cards, but of closed pouches, was over 98,000,000 miles during the year. The number of letters handled and distributed by the employés of the railway mail service in postal cars during the 12 months was about 1,669,000,000, besides which there were nearly 980,000,000 newspapers; showing an increase of about 400,000,000 pieces, or nearly 20 per cent. in the amount of work as compared with the preceding year. The total number of errors in distribution (many of which were, however, merely technical and involved no delay) was about 763,000—or one error in each 3,500 pieces. The railway mail service employs 1,091 traveling postal cars, 1,193 route agents, 247 mail messengers, and 134 local agents."

St. Croix Land Grant.—The recent decision of the

United States Circuit Court in the St. Croix land-grant cases is taken as a victory for the North Wisconsin Company, which has built some 40 miles of road to secure the grant. It is said, however, that that company will appeal from so much of the decision as awards a portion of the grant to the Wisconsin Farm Mortgage Land Company.

St. Joseph & Des Moines.—This road is now completed to Albany, Mo., 50 miles northeast from St. Joseph. Albany is a considerable town, and the centre of a large farming region.

St. Louis, Alton & Terre Haute.—The coupons due May 1 on the second-mortgage preferred bonds are now being paid at the Third National Bank in New York, pursuant to order of the United States Circuit Court.

St. Louis, Hannibal & Keokuk.—This company is offering its first-mortgage 7 per cent. bonds for sale in New York at 90, for the purpose of securing money needed to complete the road. The road is now in operation from Hannibal, Mo., southward to Prairieville, 49 miles, and is partly graded to Gilman Springs, 35 miles further.

St. Louis & San Francisco.—The Kansas Division is now completed, and will be open for traffic Nov. 10, to Neodesha, Kan., 14 miles westward from the late terminus at Cherryvale, and 41½ miles beyond the old terminus at Oswego. The company hopes to have trains running by Dec. 1 to Fredonia, 1½ miles beyond Neodesha, and is pushing the work on beyond that point toward Wichita.

St. Paul, Minneapolis & Manitoba.—The Branch Line is now completed and in operation to St. Olof, in Otter Tail County, Minn., 34 miles west by north from the former terminus at Alexandria, and 176 miles from St. Paul.

St. Paul, Stillwater & Taylor's Falls.—The St. Paul Pioneer-Press of Nov. 2 says: "Yesterday there was a meeting of the board of directors of the St. Paul & Sioux City Railroad Company and also of the board of directors of the St. Paul, Stillwater & Taylor's Falls Company, both being held to consider a proposition for the consolidation of the two companies. This proposition was agreed to by both boards, and the St. Paul, Stillwater & Taylor's Falls and the Hudson & River Falls roads were formally turned over to the St. Paul & Sioux City, which will hereafter operate them as a part of its extensive system. The agreement is that the St. Paul & Sioux City Company will exchange their common stock share for share for that of the St. Paul, Stillwater & Taylor's Falls Company, at any time within three months from this date. For the purpose of making the exchange, William R. Merriam, cashier of the Merchants' National Bank, has been appointed trustee. The common stock of the St. Paul & Sioux City is now quoted at thirty cents. Two or three years ago, the stock of the St. Paul, Stillwater & Taylor's Falls was selling for five or six cents. That it is now exchanged on equal terms with the St. Paul & Sioux City is a cheerful indication of the greatly increased value of this property. In fact, it has been excellently well managed, and is now on a paying basis. It will be greatly strengthened in every way by its consolidation with the St. Paul & Sioux City."

The St. Paul, Stillwater & Taylor's Falls road extends from St. Paul to Hudson, Wis., 21 miles, with a branch to South Stillwater, 3 miles. Its track is used by the Chicago, St. Paul & Minneapolis road. The company has \$290,000 stock and \$619,500 funded debt. The Hudson & River Falls road was built last year and runs from Hudson, Wis., to River Falls, 12½ miles.

Toledo & Milwaukee.—This company has filed articles of incorporation for a railroad to run from a point on the Toledo & Ann Arbor road near the state line between Ohio and Michigan, across Michigan to Allegan, where connection will be made with the Grand Haven Railroad to Grand Haven. The road will be 144 miles long, and the capital stock is to be \$1,500,000.

Valley of Ohio.—The track on this road is now laid from Canton, O., northward to a point in the city of Cleveland, a distance of 59 miles, leaving only about a mile of track to be laid to reach the depot and terminus in Cleveland. This work, the ballasting and finishing up, building stations and similar work will take some weeks yet, and it is hardly probable that road will be opened for business much before the end of the year.

The road was projected seven or eight years ago and some work done upon it, but financial troubles put a stop to it after a year or so, and little or nothing has been done until the present year. It is designed to connect Cleveland by a direct line with the coal and iron regions of Southern Ohio, and it is not intended to have its permanent terminus at Canton. As soon as possible it will be extended some 20 miles further south to Canal Dover, where it will connect with the Marietta, Pittsburgh & Cleveland road. The section now completed follows generally the course of the Cuyahoga River and the old canal, and the entrance into Cleveland is on the bed of the canal, the use of which was secured from the city.

Wabash.—It is rumored that this company has concluded an agreement by which the east-bound business of the road is to be turned over to the Lake Shore, at Toledo, and in return the Wabash is to receive the bulk of the St. Louis and southwestern business of the Lake Shore and New York Central. The rumor is, probably, based upon the negotiations for establishing a freight line over the New York Central, the two Canada roads (Canada Southern and Great Western) and the Wabash.

Western & Atlantic.—A dispatch from Atlanta, Ga., says that Col. E. W. Cole, President of the Nashville, Chattanooga & St. Louis Company, has lately bought several of the shares in the Western & Atlantic lease, and that it is the evident purpose of that company to secure control of the road, if it has not already done so. The road, it will be remembered, is owned by the state of Georgia, and the company now operating it is an association formed for the purpose of leasing it from the state.

West Jersey & Atlantic.—This company, whose preliminary formation we have already noted, has completed its organization and filed articles with the Secretary of State of New Jersey, with the deposit of \$2,000 per mile, as required by law. The line is from Newfield, on the West Jersey road, to Atlantic City, 35 miles.

ANNUAL REPORTS.

The following is an index to the reports of companies which have been reviewed in previous numbers of this volume of the *Railroad Gazette*:

Page
Allegheny Valley..... 259
Atchison & Nebraska..... 305
Atchison, Topeka & Santa Fe..... 277
Atlanta & Charlotte Air Line..... 204
Atlanta & West Point..... 505
Atlanta & Great Western, 172, 176
Atlanta, Miss. & Ohio..... 302
Baltimore & Potomac..... 302
Boston & Albany..... 78

Page
Maine Central..... 173
Maine Minor Railroads..... 548
Manchester & Lawrence..... 318
Marquette, Houghton & Ont..... 368
Massachusetts Minor Railroads 446
Memphis & Charleston..... 191
Michigan & Saginaw..... 262, 266, 277
Michigan R. R. Commissioner..... 309
Minnesota Minor Railroads..... 332

Boston, Clint., Fitch, & N. B.	12	Mississippi & Tennessee	247
Boston, Concord & Montreal	333	Missouri, Kansas & Texas	434
Boston & Lowell	343	Mobile & Girard	384
Boston & N. Y. Air Line	343	Mobile & Montgomery	390
Bur. & Mo. River in Nebraska	518	Mobile & Ohio	505
Cairo & St. Louis	366	Montpelier & Wells River	152
Camden & Atlantic	372	Morris & Essex	248
Central, of Iowa	151	Nashua & Lowell	352
Central, of New Jersey	121	Nashville, Chatto., & St. L.	401
Central Pacific	363, 575	Natchez, Jack., & Col.	247
Charlotte, Col.	291	New Jersey Midland	190
Charterers (P. C. & St. L.)	292	New Jersey Minor Railroads	575
Chesapeake & Ohio	292	N. Y. Lake Erie & West	43
Chesapeake & Ohio Canal	392	New York Minor Railroads	518
Chicago & Alton	163	New York & New England	122
Chi., Burlington & Quincy	160	N. Y., N. H. & Hartford	40
Chicago & East. & St. L.	162	N. Y., Providence & Boston	12
Chicago & Milwaukee	160	North American Engineer	127
Chicago, Mil. & St. Paul	269	Northwestern (S. C.)	121
Chi., Rock Island & Pac.	372, 378	Northern Central	121
Cin., Hamilton & Dayton	384	Northern (New Hampshire)	304
Cin., & Mus. Valley	382	Northern Pacific	562
Cleve., Col., Cin. & Ind.	160	North Pennsylvania	231
Cleveland & Pittsburgh	160	Ogdensburg & Lake Champlain	306
Cleveland & Pittsburgh	160	Oregon & California	105
Cleve., Tus. Val. & Wheeling	218	Pacific & Elizabeth	362
Col., Chic. & Ind. Cent. (P. C. C. & St. L.)	205	Panama	348
Col. & Hocking Valley	320	Pennsylvania	128, 136
Colombia & Toledo	320	Pennsylvania Company	434
Concord & Claremont	423	Pennsylvania & New York	292
Connecticut Minor Railroads	402	Philadelphia & Reading	30
Concord & Passumpsic Rivers	402	Phila., Wil. & Baltimore	124
Connecticut River	66	Pitts., Cin. & St. Louis	205
Cumberland Valley	506	Pitts., Titusville & Buffalo	206
Cumtuck Southern	66	Pitts., V. & A. Ry.	206
C. & O. & N. W. Northwestern	476	Portland & Worcester	201
Dayton & Southern	126	Providence & Worcester	209
Delaware	54	Pullman Palace Car Co.	617
Delaware & Bound Brook	248	Quebec, Mont., Ott. & Ogd.	422
Delaware & Hudson Canal	276	Richmond & Danville	91
Del., Lack. & Western	77	Richmond, Fred. & Potomac	78
Detroit & Bay City	348	Rock Island & Peoria	248
Detroit & N. & W.	62	Rome, W. town, & Oneida	147
Delaware Western	153	Rutland	416
Eel River	166	St. Joseph & Denver City	395
Erie & Pittsburgh (Penns. Co.)	218	St. Louis, Alt. & Terre Haute	445
Evansville & Terre Haute	588	St. Louis Bridge & Tunnel	468
Fitchburg	24	St. Louis, Iron Mt. & Southern	180
Ind. & Pac. & Erie Marquette	384	St. Louis, Kan. City & Northern	192
Galt, Houston & Henderson	318	St. Louis & San Francisco	416
Georgia	304	St. Louis & San Joaquin	314
Grand Rapids & Indiana	408	St. Louis, Van. & Terre Haute	78
Grand Trunk	277	St. Paul & Duluth	410
Great Western, of Canada	278	St. Paul & Sioux City	480
Hannibal & St. Joseph	152	Sandersville & Tennille	446
Hartford, Prov. & Fishkill	122	Scioto Valley & St. Paul	319
Hawthorne, Raton & Eastern	126	South Carolina	492
Houston & Galveston	153	Southern Central	348
Hunt & Broad Top Mountain	92	Southern Minnesota	422
Illinois Central	53	Terre Haute & Indianapolis	492
Illinois Minor Railroads	480	Texas & Pacific	491
Illinois Railroad Commission	117	Troy & Boston	54
Ind. & Pac. & W. & E.	165	Union Pacific	165
Ind., Cin., & La. Pacific	576	United New Jersey	595
Indianapolis & St. Louis	206	U. S. Rolling Stock Co.	77
Ind. & Vincennes (Penns. Co.)	218	Utica & Black River	394
International & Gt. Northern	293	Vicksburg & Meridian	385
Iowa Minor Railroads	458	Virginia Minor Railroads	488
Iowa Railroad Commission	6	Wabash	182
Jen. City, St. Joe & C. Bluff	303	Wash. City, Va. Mid. & Gt. So.	54
Kansas Pacific	121	Western Maryland	588
Kentucky Central	320	Western Railroad Association	44
Lake Erie & Louisville	531	Western Union Telegraph	588
Lake Shore & Mich. South	254, 261	West Jersey	394
Lehigh Valley	361	Wilmington & Northern	348
Leaven., Lawrence & Gal.	350	Wilmington & Weldon	66
Little Miami (P. C. & St. L.)	205	Wisconsin Minor Railroads	506
Long Island	12	Wis. Railroad Commission	79
Louisville & Nashville	547	Worcester & Nashua	106

Boston, Revere Beach & Lynn.

This company owns and operates a road (of 3 ft. gauge) from East Boston, Mass., to Lynn, 8.8 miles, and a steam ferry between Boston and East Boston. Its last fiscal year ended Sept. 30, 1879, and the statements below are from the reports for that year, read at the annual meeting last week.

The stock, debt, etc., are as follows:

Stock (\$24,409 per mile)..... \$349,200.00
Bonds (\$15,682 per mile)..... 138,000.00
Notes payable (\$15,176 per mile)..... 133,548.00
Bills, accounts, etc..... 8,920.58
Profit and loss..... 62,666.00

Total..... \$602,343.58

Road and equipment (\$58,250 per mile)..... \$512,598.97

Real estate..... 43,486.59

Ferry account..... 110,966.52

Cash, materials, etc..... 25,291.50

602,343.58

statements in regard to both will be presented at the meeting.

The earnings for the half-year were as follows:

	1879.	1878.	Inc. or Dec.	P. c.
Gross receipts	£282,500	£281,003	D. £48,134	5.5
Working expenses	63,423	66,253	D. 32,833	4.9
Net earnings	£198,446	£213,750	D. £15,304	7.2
Add interest on International Bridge capital	12,980			
Total	£211,426	£213,750	D. £ 2,324	1.1
Less postal and military revenue on bonds retired	438	540	D. 102	18.9
Net balance	£210,988	£213,210	D. £ 2,229	1.0
Per cent. of expenses	76.17	75.73	I. 0.44	0.6

The decrease in passenger receipts was £3,636, or 1.5 per cent.; in freight receipts, £34,494, or 5.8 per cent. Charges for maintenance and renewals were decreased by £20,831, and for working the road by £11,998. The proportion of the working expenses (excluding maintenance and renewals) to the gross receipts increased from 48.98 to 50.37 or 1.39 per cent., although there was decrease in the expenditure of £11,998, owing to the diminution of the gross receipts, but the total working expenses, including expenditure for maintenance and renewal of road and rolling stock, was only increased in the proportion of 0.44 per cent.

The disposition of net earnings was as follows:

	Net balance	£210,988
Interest on lands, Montreal Seminary, Island Pond and British Am. Land Co. debentures	20,336	
Rents, Atlantic & St. Lawrence	52,545	
" Lewiston & Auburn	1,849	
" Detroit Line	11,250	
Montreal & Champlain	8,530	
Buffalo & Lake Huron	35,000	
Interest on equipment bonds	27,060	
5 per cent. debenture stock	67,492	
	210,682	

Balance for the half-year

Guelph (the receipts and working expenses of which, for the half-year to July 31, 1879, are incorporated in the accounts of the main line and branches), the loss in working the leased lines is £12,988, as compared with £6,746 in the corresponding half-year. A large proportion of this loss is attributable to the Wellington, Grey & Bruce Railway, upon which the decrease of earning has been chiefly caused by the line having been blocked by snow for some weeks at the commencement of the half-year; while the large expenditure for maintenance still found necessary, arising, as explained in previous reports, from the original imperfect construction of the line, continues seriously to affect the net results. Under traffic agreements with the Wellington, Grey & Bruce Company, the sum of £2,573, being the equivalent of 20 per cent. of the half-year's additional traffic interchanged with that company, will be applied to the acquisition, on the 1st of January, 1880, of Wellington, Grey & Bruce bonds at par.

The working of the Detroit, Grand Haven & Milwaukee Railway, since its reorganization under the control of the Great Western, has been in all respects satisfactory, and it is expected that the operations of that road for the current year will result in material advantage to the company.

The report says, in conclusion: "The directors are able to report that the permanent way and rolling stock are in excellent order, and in a condition to move promptly and economically the increased traffic arising from the revival of trade in the United States, and from the abundant harvest in America and Canada. In addition to these advantages, the improved rates expected from the more settled and pacific policy recently inaugurated by the through lines, lead the directors to look hopefully on the prospects of the present half-year."

Boston & Albany.

The annual report of this company has been completed for transmission to the Massachusetts Railroad Commission, and gives the following figures. It is for the year ending Sept. 30, and covers 321.58 miles of road, of which 201.65 miles are main line; 47.98 miles branches owned, and 71.90 miles branches leased.

The traffic for the year was as follows:

	Train mileage	1878-79.	1877-78.	Inc. or Dec.	P. c.
Passenger	1,366,103	1,285,825	D. 19,722	1.4	
Freight and other	3,523,669	3,638,358	D. 114,089	3.2	
Total	4,889,772	5,024,183	D. 134,411	2.7	
Passenger carried	5,199,160	5,200,641	D. 1,481	-0.2	
Passenger mileage	101,248,321	101,221,955	I. 26,360	0.3	
Tons freight carried	2,738,096	2,642,555	I. 95,541	3.6	
Tonage mileage	325,484,799	320,708,573	D. 4,223,774	1.3	
Average pass. train load, No.	74.11	73.04	I. 1.07	1.5	
AV. receipt:					
Per passenger per mile	2.140 cts.	2.240 cts.	D. 0.100 ct.	4.5	
Per ton per mile	1.073 "	1.129 "	D. 0.056 "	5.0	

Passenger business was substantially the same as for the previous year; freight traffic shows a decrease for the first time in four years, the figures indicating a gain in local and a loss in through freight. The business was done with a proportionate decrease in train mileage and consequently greater economy. The decrease in rates was sufficient to make a serious difference in earnings; the rates of the previous year would have given increased earnings of \$101,248 on passengers and \$182,271 on freight.

The earnings and expenses for the year were as follows:

	1878-79.	1877-78.	Inc. or Dec.	P. c.
Passenger Department	£2,165,699	£2,537,987	D. 372,238	14.7
Freight Department	5,588,839	5,733,131	D. 145,292	3.9
Other sources	672,695	361,400	I. 311,450	116.2
Total	£6,427,463	£6,633,534	D. 206,071	3.1
Expenses	3,723,825	4,413,997	D. 690,172	15.6
Net earnings	£2,703,636	£2,219,537	I. 484,101	21.8
Gross earn. per mile	19.600	20.631	D. 0.641	3.1
Net earn. per mile	8,409	6,903	I. 1,506	21.8
Per cent. of exps.	57.94	66.54	D. 8.60	12.9

A large reduction in expenses enables the road to show a considerable gain in net earnings on a small loss in gross earnings. It is very probable that the limit of economy has been reached, especially in view of the extensive improvements now projected.

The income account was as follows:

	Net earnings	£2,703,636
Renta of leased lines	875,000	
Interest on funded debt	470,000	
Dividends, 8 per cent.	1,600,000	
Improvement fund	450,000	
		2,595,000

Surplus for the year

	Surplus Sept. 30, 1878.	£108,636
Less uncollected accounts	42,475	2,382,586

Total surplus

£2,491,224

Improvement fund is a new charge on income, and the amount under that head is doubtless set aside to meet the cost of the new terminal improvements in Boston.

No passengers were killed, but 7 were injured by jumping from moving trains. Twenty employees were killed and 38 injured; 24 others (chiefly persons walking on the track) were killed and 10 injured during the year.

East Tennessee, Virginia & Georgia.

This company owns a line from Bristol, Tenn., southwest to Chattanooga, 242 miles, with a branch from Cleveland, Tenn., to Dalton, Ga., 28 miles, making 270 miles in all. It also owns the Cincinnati, Cumberland Gap & Charleston road, from Morristown, Tenn., to Wolf Creek, but the earnings of that line are, we believe, kept separately. It leases the Memphis & Charleston road, for which also a separate report is made. The following statements for the year ending June 30, 1879, are published in advance of the issue of the full annual report.

There were no changes in the general balance sheet other than those required by the income account as shown below.

The total tonnage of freight moved was: 1878-79, 273,482; 1877-78, 266,055; increase, 34,427 tons, or 14.4 per cent.

The earnings for the year were as follows:

	1878-79.	1877-78.	Inc. or Dec.	P. c.
Passage	£270,438	£305,532	D. 35,114	11.5
Freight	650,087	648,294	I. 2,393	0.4
Express and mails	60,456	63,022	D. 3,166	5.0
Miscellaneous	6,710	4,784	I. 1,926	40.1
Total	£988,201	£1,029,262	D. £33,961	3.3
Expenses	620,103	612,643	I. 7,460	1.3
Net earnings	£368,188	£409,609	D. £41,421	10.1
Gross earnings per mile	3,600	3,786	D. 126	3.3
Net earn. per mile	1,304	1,517	D. 153	10.1
Per cent. of expenses	61.74	59.94	I. 1.80	3.0

A very slight increase in freight and a considerable loss in passenger earnings resulted in a decrease of 3.8 per cent. in gross receipts. This, with a small but unavoidable increase in expenses, reduced the net earnings by about 10 per cent., still leaving them 13 per cent. larger than those for 1876-77.

The income account was as follows:

	Net earnings	£368,188
Interest account		£265,676
Compromise of suits, charged to profit and loss		3,750
Dividends of 3 per cent., May 1, 1879		58,872

328,298

Surplus for the year

	Add interest on Western North Carolina bonds owned	£39,860
		16,030

16,030

Total surplus

£55,020

This total surplus was equivalent to an additional 2% per cent. on the stock.

During the year 22 miles of road were renewed with steel and 4½ miles with iron rails; 80,930 new ties were put in the road and 33 miles of track were ballasted with broken stone. Two new locomotives were bought and paid for, and the usual repairs and rebuilding of other locomotives and cars were made. All these renewals and improvements of the property were charged to expenses. The increase in expenses was entirely in general expenses, the actual cost of working the road showing a slight decrease.

Memphis & Charleston.

This company owns a line from Memphis, Tenn., to Stevenson, Ala., 272 miles, with an extension to the levee in Memphis, 1 mile, and branches from Moscow, Tenn., to Somerville, 14 miles, and from Tuscaloosa, Ala., to Florence, 5 miles, making 292 miles in all. The trains use the Nashville, Chattanooga & St. Louis track from Stevenson to Chattanooga, 38 miles. The road is leased to the East Tennessee, Virginia & Georgia Company, but separate reports are made.

The following statements for the year ending June 30, 1879, are published in advance of the completion of the full annual report.

The total tonnage of freight carried was: 1878-9, 148,377; 1877-8, 158,458; decrease, 10,081 tons, or 6.4 per cent., due entirely to the derangement of business at Memphis.

The earnings for the year were as follows:

	1878-79.	1877-78.	Inc. or Dec.	P. c.
Passenger	£315,229	£383,233	D. £68,004	17.7
Freight	408,454	531,086	D. £2,632	11.8
Mail and express	39,489	42,442	D. 2,953	6.8
Rents, etc.	39,341	33,056	I. 6,245	18.9
Total	£862,513	£989,857	D. £127,344	12.9
Expenses	631,475	682,412	D. 50,937	7.5

12.9

Net earnings

£231,038

Interest and exchange

301,120

Deficit for the year

£